

Journal

OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

AVMA Convention—Philadelphia, August 18-21, 1958

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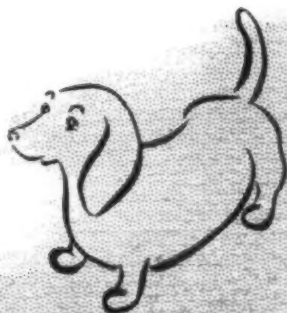
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Correspondence

April 8, 1958

Dear Doctor Kester:

I have a carbon copy of Mr. Rongren's letter to you, acknowledging receipt of your contribution of \$500 to be deposited to the Research Fund of the Research Council.

I could not merely place this copy of Mr. Rongren's letter in the AVMA research files without personally acknowledging my thanks also to you for your foresightedness and generosity. We had occasion to be in Chicago on March 24 at the annual meeting of the AVMA Fellowship Committee and, at that time, Dr. Hardenbergh brought out the fact that a large percentage of our professional colleagues fail to give anything at all to our Research Fund. It is indeed a pathetic and regrettable fact that we are unable to award Fellowships to many well qualified applicants largely because of the lack of financial assistance.

The practitioners in the field of both small and large animals fail to be cognizant of the fact that the research that is being conducted at institutions throughout this country, frequently by AVMA Fellows, to a large degree aid them to maintain their professional standing and practice over the years. Yet, as you and I both know, they fail to reciprocate when asked for a contribution for the Research Fund.

I suggested at the last Research Council meeting that perhaps we could do more indoctrination at the Junior AVMA level. I have tried this personally at our own institution and believe it or not, the student body of their own accord contributed a considerable sum of money to the Research Council. The student wives baked cookies and raised approximately another \$100 which they too contributed. Perhaps if we start at the grass roots, when our present students receive a request after they will have their DVM's, it may hold some significance for them.

Sincerely yours,
s/R. GETTY, *Chairman,*
AVMA Research Council.

• • •

April 30, 1958

Dear Mr. Rongren:

We are deeply appreciative to you and members of the American Veterinary Medical Association staff for the courtesies extended to our senior class during our recent visit to your office.

I feel certain that as a direct result of this visit every member of the group left with a much better appreciation for the variety of services offered to him through membership in the association.

Very truly yours,
s/E. W. ADAMS,
Tuskegee, Ala.

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Cattle Diseases Call for Veterinary Check

Three new transmissible diseases of cattle have added their threat to the farm profit picture, according to a report today by the American Foundation for Animal Health.

Diagnosis by a veterinarian in instances of these diseases is doubly important, because of similarity in the symptoms, and their several other cattle diseases are

Veterinarians Solve Repeat Breeding

By having the veterinarian examine and treat cows, the herd owner can help solve the problem of repeat breeding, according to experimental work cited today by American Foundation for Animal Health.

Treatments by a veterinarian reduced the number of breedings necessary for a cow to produce a calf, and also brought improvement in other

Alert Sheep Men on Pregnancy Disease

This is the season when sheep owners may expect signs of pregnancy disease to show up among ewes, the American Foundation for Animal Health warned today.

If a veterinarian is called promptly after the first symptoms are noticed, he can usually prevent the disease in the balance of the flock, and save a percentage of the flock. Early symptoms

Tens of thousands of animal owners are now reading about modern veterinary service in their local newspapers. They are being alerted to animal disease hazards . . . and learning to call their veterinarian as the best safeguard against losses.

Nearly 3,700 newspapers are being furnished with this year 'round, coast-to-coast news service by American Foundation for Animal Health, the educational bureau of Associated Veterinary Laboratories. Yet this is but one of many steps in the nation-wide public relations campaign for the profession being underwritten by this group. Other phases include farm magazines, radio, television . . . every major channel of mass education.

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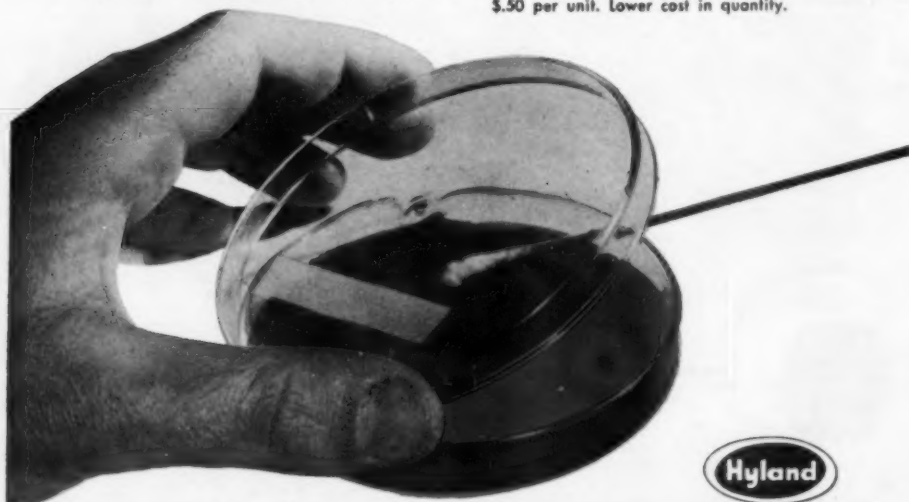
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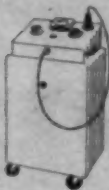
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Washington News



Legislative.—The Senate, on May 21, cleared for House consideration a bill (S.3076) to authorize transportation in U. S. of live foot-and-mouth disease virus for research purposes (see JOURNAL, Feb. 15, 1958, adv. p. 10; May 15, 1958, adv. p. 8); also cleared for the House, May 21, bill (S.3478) to insure maintenance of an adequate supply of anti-hog cholera serum and hog cholera virus.

Passed by the House, May 20, a bill (H.R. 12126) amending the Act of June 17, 1930, to provide for further protection against the introduction and dissemination of livestock diseases. The House on May 5 amended, then cleared for Senate consideration bill H.R. 11414, authorizing the surgeon general of P.H.S. to apportion \$1,000,000 yearly among schools of public health. The bill, as amended, limits program to two years and use of grants to specific programs rather than general operating expenses.

Military pay bill became P.L. 85-442 with signature of the President on May 20 (see JOURNAL, April 15, 1958, adv. p. 8).

Senate-House conferees may complete action on fiscal 1959 U.S.D.A. appropriations at their next meeting, May 26, thus clearing bill for final action in both Houses early in June (see JOURNAL, April 15 and May 15, 1958, adv. pages 8).

Health and Science Subcommittee, House Committee on Interstate and Foreign Commerce, May 22, ordered favorably reported to the full committee a bill (H.R. 9521) to define the term "chemical preservative" as used in the Federal Food, Drug, and Cosmetic Act.

S. J. Res., 173, introduced by Senators Ellender (D., La.) and Aiken (R., Vt.), would designate the week of November 21-27, 1958, as National Farm-City Week.

★ ★ ★ ★

Miscellaneous.—Military credit—AVMA Convention: It is expected arrangements between Department of the Army will be completed shortly whereby veterinary reserve officers attending the Ninety-Fifth Annual Meeting, and not on active military duty, may receive credit for training and retirement purposes. Since the program of the several section meetings will list numerous scientific subjects having direct military application, it is believed that the entire program will receive favorable consideration for the award of these retirement point credits.

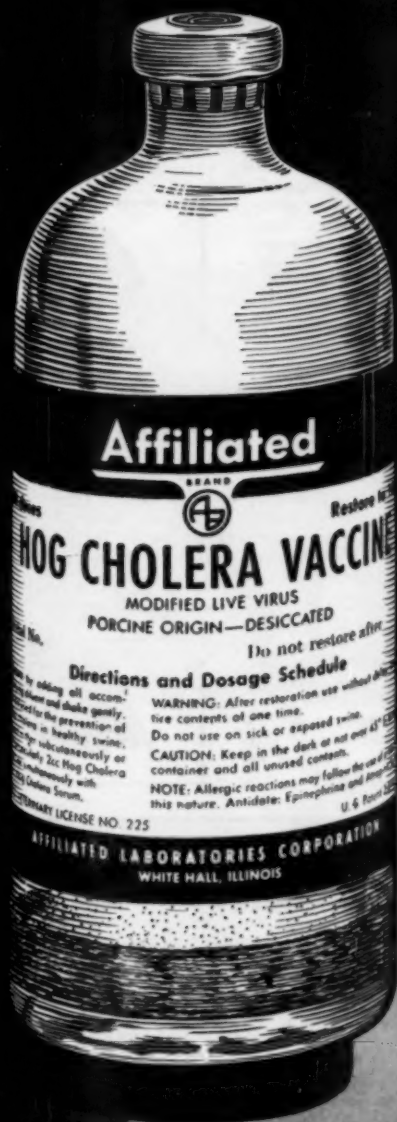
As soon as final approval is received, information regarding the procedure to obtain credit will be available at Convention Hall in Philadelphia each day during the annual meeting.

The President has sent the nomination of Arthur S. Flemming, educator and expert in government management, to the Senate as Secretary of Department of Health, Education, and Welfare. Secretary Folsom is resigning because of ill health, according to reports. Dr. Flemming, president of Ohio Wesleyan University, has served previously during the administrations of Roosevelt, Truman, and Eisenhower. He last served as director, Office Defense Mobilization, Executive Office of the President.

Small Business Administration approved \$18,748,000 in loans to small business firms in March, of which more than \$750,000 went to operated-for-profit enterprises in the health services. Recipients included four nursing homes, two hospitals, two medical clinics, and two veterinarians.

Swine breeders and farm organizations have expressed concern over decline in hog cholera vaccination, according to a report released by U.S.D.A. on May 22, 1958. Although ARS officials stated there is no evidence of hog cholera increasing, fewer vaccinations could increase chances of costly outbreaks of the disease.

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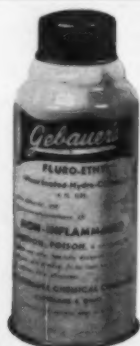


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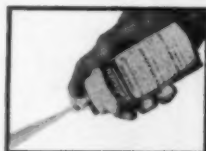


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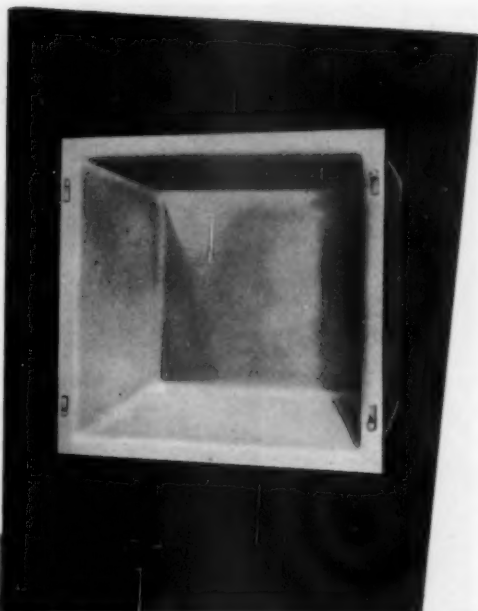
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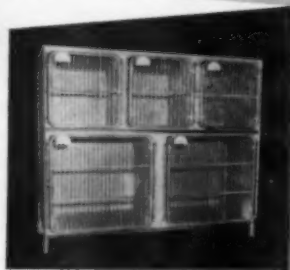
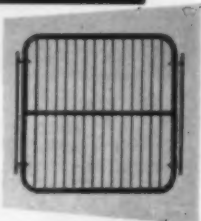
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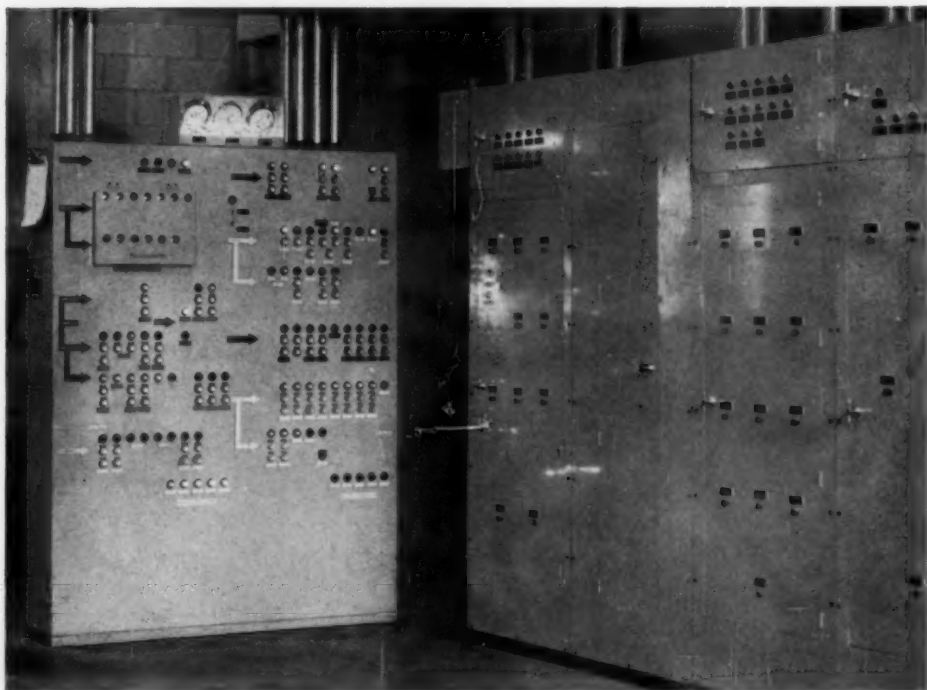


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REFERENCES: 1. Bull, W. S.; N. Amer. Vet., in press. 2. Henry, R. T., and Blackburn, E. G.; Vet. Med., in press.

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*Jones, S. V.; Belloff, G. B., and Roberts, H. D. B.: Vet. Med. 51:413 (Sept.) 1956.

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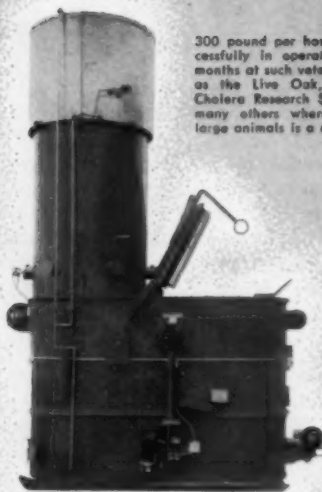


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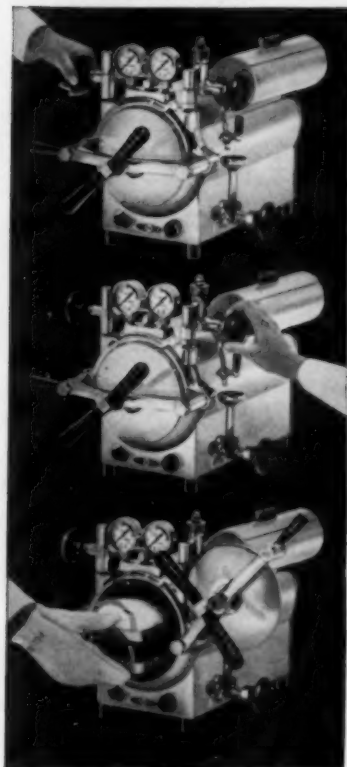
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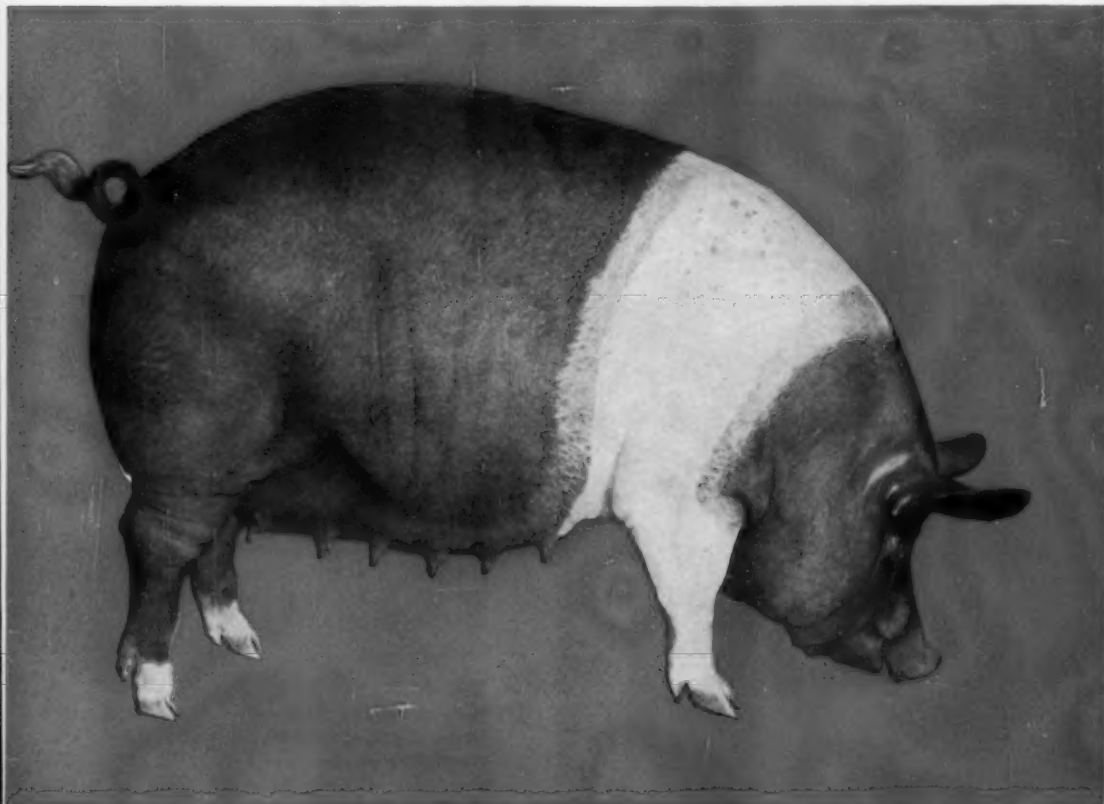
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Repositol Diethylstilbestrol as an Abortifacient in Feedlot Heifers

H. J. HILL, D.V.M., and R. E. PIERSON, D.V.M.

Fort Collins, Colorado

VARIOUS TYPES of estrogenic hormones derived from several sources have been known to prevent or interrupt pregnancy in mammals. Although data in the medical literature reveal a multitude of conflicting results, it seems evident that two factors are primarily involved in the effectiveness of the estrogen: (1) the dosage and (2) the stage of pregnancy. Duration of absorption of the product has been suggested as another important factor.^{2,3}

The elimination of most estrogens is rapid. However, the advent of the slowly absorbed, long-acting steroids has minimized this factor and thus made the estrogenic abortifacient a practical, one-injection technique.

THEORIES AND OBSERVATIONS ON PREGNANCY TERMINATION

In the postimplantation stages, estrogens may terminate pregnancy by killing the embryo.^{2,3} Work with rats had indicated that degeneration of the placenta varied greatly and that the placental changes could probably be interpreted as secondary results of the death of the embryo. In the cat, estrogens have been shown to pass readily into the fetal circulation.² Doses which exceed the physiological tolerance may have a toxic effect upon the fetus.

The above theory is not infallible and a second philosophy may be constructed from facts known about the physiology of the uterus.^{5,11}

A profound and complex chain of metabolic events is initiated by a rising blood level of estrogen. Follicular or placental estrogens bring about these reactions at specific times. Therefore, it is logical to assume that hyperphysiological doses of

exogenous estrogens would initiate a similar reaction, even in the pregnant animal.

The stimulatory effect of estrogens upon uterine muscle fibers is direct¹² in the sense that they do not depend upon the presence of the pituitary or any other endocrine gland. Thus, it was concluded¹⁴ that estrogens bring about myometrial activity by first setting up a chain of metabolic events which, upon nearing completion, are accompanied by the onset of estrous-type coordinated contractions.

It may then be postulated that the metabolic changes may adversely affect the delicate vascular structure of the maternal-fetal placental union and, perhaps, initiate microscopic separation of these two layers of tissue.

Superimposed upon this phenomenon would be the effect of myometrial activity upon what should be a quiescent uterus. It is conceivable that the net effect would be to separate the placental attachments, resulting in death of the fetus and expulsion of the uterine contents.

Several interesting observations were made during this research which may or may not be explained by either of the above theories. In some instances, the fetus was aborted within 24 hours after the second injection which was given three weeks after the first. This might indicate that the conceptus had been devitalized and at least partially separated from its maternal placenta by the first dose, and was readily ejected by the reinitiated uterine contractions precipitated by the second injection of estrogen acting upon a presensitized myometrium. Probably, posterior pituitary secretions were also stimulated, thus providing a supplemental stimulus to uterine contractions.

Some fetuses were expelled with their enveloping membranes intact, suggesting that separation had occurred as a direct or indirect result of the death of the fetus. The cotyledonary surfaces were avascular and pale, as though they had been deprived of the blood coming from within the fetus for several hours, or even days.

Since some fetuses were not aborted until 25 days after the first injection, it is unlikely that the

Dr. Hill is veterinarian in charge, Colorado State University, Artificial Breeding-Bull Testing Service; and Dr. Pierson is head of the ambulatory clinic, College of Veterinary Medicine, Colorado State University, Fort Collins.

The Repositol Diethylstilbestrol was provided by Pitman-Moore Co., Indianapolis, Ind.

TABLE 1.—The Results of Using an Abortifacient in Feedlot Heifers

Dosage (mg.)	30-60 days ^a		60-90 days		90-120 days		120-150 days		150-180 days		180-210 days		210 or over		Totals	
	Anim. (No.)	Aborted (%)	Anim. (No.)	Aborted (%)	Anim. (No.)	Aborted (%)	Anim. (No.)	Aborted (%)	Anim. (No.)	Aborted (%)	Anim. (No.)	Aborted (%)	Anim. (No.)	Aborted (%)	Anim. (No.)	Aborted (%)
75	...	...	5	4	80	2	3	100	2	0	...	...	...	...	12	7
100	61	50	89	69	72	108	66	52	79	4	0	0	6	5	347	279
125	...	...	...	...	...	29	10	8	80	69	53	77	...	...	108	83
150	...	...	...	...	...	...	60	58	97	15	14	93	48	37	123	109
175	...	...	...	...	...	...	...	...	...	34	23	68	14	10	71	55
Totals	61	50	81	94	73	139	121	87	124	90	73	68	52	76	24	58
															649	517

^aEstimated stage of pregnancy; 00 number of pregnant heifers treated; number and percentage which aborted.

estrogen caused ejection of the conceptus merely by direct stimulation of myometrial contractions. However, it is known that a decomposing placenta may produce local irritation and a resulting uterine activity.¹²

Four animals carefully palpated at the second post-treatment examination were found to be carrying shrunken, amorphous masses which resembled hematic mummies. Such mummification in cattle is known to be caused by interplacental hemorrhage and death of the fetus although, in this instance, it has been proposed¹³ that the hemorrhage occurred first.

VALUE OF THERAPEUTIC ABORTION IN CATTLE

Not only is it interesting to theorize on the mechanism involved in this method of causing ejection of uterine contents, but this physiological phenomenon can be utilized practically in aborting pregnant heifers which are being fattened in feedlots. An economic indication for this is that buyers of cattle for packers may deduct as much as \$40 per head if heifers appear "heavy with calf" or "springing." To avoid this, a premium of as much as \$2/cwt. is usually demanded for heifers destined for the feedlot if they are guaranteed to be "open."

In some cases, the feedlot operator buys heifers with an indefinite pregnancy status and the seller agrees to refund perhaps \$25 for each animal which is docked for being pregnant at the time it is sent to market.

The latter arrangement often proves unsatisfactory because, if fat heifers are retained in the feedlot until they calve, they are especially subject to dystocia, retained fetal membranes, metritis, mastitis, and prolapse of the vagina or uterus, with their complications. These animals, if they recover, often reach the market several months later in an undesirable weight bracket.

Repositol diethylstilbestrol (100 mg.) was reportedly used to induce abortion in a 13-month-old, 525-lb. heifer that had been bred accidentally.¹ The 6-month fetus was aborted 13 days later. When a similar dose was injected intramuscularly to induce abortion in pregnant feedlot heifers, the majority were reported to have aborted.⁹ However, it had not been determined which were actually pregnant at the time of the injections. Approximately 80 per cent of heifers 30 to 180 days pregnant were reported¹⁷ to have aborted after injections

of 125 mg. of a similar product.* The effectiveness in both groups was reported^{9,17} as considerably reduced in animals pregnant 180 days or more.

More critical studies should be made if the veterinary profession is to make judicious use of therapy in correcting other accidental pregnancies, such as so-called "mismating"¹⁷ and conception in animals too young to avoid dystocia.

This study was undertaken to determine the following: (1) the efficiency of estrogens as abortifacients in cattle; (2) the effective dose in relation to the period of gestation; (3) the possible effects on weight gains or losses due to the influence of estrogens on feed consumption and metabolism; and (4) any adverse effects of induced abortion.

MATERIALS AND METHODS

Between the middle of October, 1956, and early February, 1957, 2,760 Hereford heifers in varying degrees of fatness were examined *per rectum* in 29 feedlots, and 761 were found to be pregnant. The heifers had been in the feedlots at least 30 days when examined and treated.

Their weights ranged from 500 to 900 lb. and represented animals in all degrees of finish (fatness) and at all levels of food intake. Each pregnant animal was identified by chain number or ear tag and the month of gestation and the gravid horn were recorded. The stage of pregnancy was estimated by rectal examination according to a chart as determined by rectal examination.⁹ Whenever possible, the aborted fetus was observed and the stage of pregnancy determined by a formula.[†]

Each pregnant heifer was injected intramuscularly with Repositol diethylstilbestrol. The dosage levels, based on reports of previous workers^{9,17} and preliminary experiments, was approximately 100 mg. for animals pregnant up to 120 days, and an additional 25 mg. for each additional month of the gestation period.

Approximately three weeks later, all treated animals were again examined rectally to determine which had aborted and whether any pathological conditions had developed in the ovaries and tubular genitalia. The animals were also examined for condition, prolapses, and mammary development. A record was made of any unusual reactions observed by the feedlot operator shortly after the injection.

Those heifers which had not aborted were re-treated with larger doses and were examined the

third time approximately three weeks later. All of the heifers in the cooperator's feedlots, both treated and untreated, were under frequent surveillance by the authors.

RESULTS AND DISCUSSION

Abortions ranged from 87 per cent for heifers pregnant 120 to 150 days down to 58 per cent for those pregnant over 210 days (table 1). If the dosage schedule is disregarded, little difference appears in the percentage of abortions up to 210 days.

It is of interest that 80 per cent of 347 animals representing all stages of pregnancy aborted when injected with a single dose of 100 mg. of the estrogen; 77 per cent of 108, pregnant from 90 to 180 days, aborted when given 125 mg.; and 89 per cent of 123, pregnant from 120 to 210 days, aborted when given 150 mg. A dose of 175 mg. did not increase the percentage of abortions in the later gestation periods.

Since heifers 120 to 210 days pregnant aborted at such an efficient level (89%) when injected with 150 mg., we could expect those less than 120 days pregnant to abort at a comparable or higher rate if given that dosage. However, 100 mg. produced satisfactory results through gestation day 150 and the additional cost would be a significant factor when hundreds of animals are involved.

Approximately one half of the animals which did not abort after the first treatment aborted after re-treatment. In most instances, the dosage was increased 25 mg. because the gestation period had advanced approximately one month.

The herd variations in the percentage of abortions from the first treatment (table 2) is accounted for by the variations in the stage of pregnancy at the time of injection and by the experimental dose levels used. The low percentage of abortions in herd 1 (59%) and herd 25 (51%) was due to the greater proportion of heifers in advanced stages of pregnancy, i.e., five months or more, while in herd 19 (59%) several types of estrogens were used, some of which were not the long-acting repositol type.

At the dosage schedule used, 70 to 100 per cent of the heifers aborted after a single treatment, and at least 50 per cent of those not aborting did so after a second treatment.

Abortions began three days after the first injection, increased in numbers until about the tenth or twelfth days, then ended

*Stilbestrol-Slow-Absorption Solution, produced by Haver-Glover, Kansas City, Mo.

†Formula—the month of gestation was squared and divided by 2 to determine the approximate length of the fetus in inches; the computed lengths of fetuses and month of gestation correlate satisfactorily through the seventh month of gestation.

TABLE 2—Summary of Estrogen-Induced Abortions in Feedlot Cattle

Herd*	No. examined	Pregnant			First treatment			Second treatment		Total abortions (%)
		(No.)	(%)	L. horn (%)	R. horn (%)	No. treated	Aborted (No.)	No. treated	Aborted (%)	
1	59	22	36	36	64	22	13	59	—	—
2	72	9	13	10	90	9	9	100	0	100
3	69	46	64	22	78	46	38	86	6	83
4	35	9	24	44	56	4	2	50	2	100
5	66	23	36	34	66	11	7	64	4	75
6	57	40	70	43	57	25	18	72	7	71
7	133	13	10	44	56	12	9	73	0	0
8	42	14	33	29	71	—	0	—	—	—
9	493	77	15	29	71	77	62	81	—	—
10	45	10	22	70	30	10	7	70	3	33
11	94	34	36	18	82	34	24	70	10	40
12	110	25	23	36	64	25	21	92	2	100
13	75	35	47	47	53	35	21	70	13	46
14	31	25	81	13	87	25	18	90	2	100
15	170	49	29	45	55	48	38	79	10	50
16	74	42	57	29	71	36	32	88	7	71
17	12	8	75	25	75	8	8	100	—	—
18	34	4	12	25	75	4	4	100	—	—
19	195	39	21	34	66	39	23	59	15	50
20	116	73	63	32	68	71	48	70	23	69
21	70	22	31	63	37	22	22	100	—	—
22	315	33	10	33	66	32	28	90	3	100
23	124	71	57	42	58	71	54	86	—	—
24	49	8	17	25	75	8	8	100	—	—
25	210	29	14	48	52	29	15	51	—	—
26	10	1	10	—	—	1	1	100	—	—
Totals	2,760	761	36	64	704	530				

*Three of the 29 herds are not included since none of the total of 90 heifers was pregnant.

after 25 days. Some animals about 7.5 or 8.0 months' pregnant aborted living calves a few days after injection and began lactation as in normal freshening. The greatest incidence of retained fetal membranes was in this group.

The low incidence of complications (table 3) during the period of observation indicates that they are of little consequence.

Mammary gland development and milk secretion were evident in many animals and seemed to be directly proportionate to the stage of pregnancy and dose level of estrogen. The udder enlargement was not objectionable two months later at sale time.

The small number of animals which

showed signs of estrus, such as riding others or standing to be ridden, bawling, nervousness, or a mucous genital discharge, were usually in early stages of pregnancy and aborted soon after the injection. Elevation of the tailhead was not observed in treated pregnant animals.

The incidence of abortions was not associated with degree of fatness, level of food intake, geographic origin, or the weight or age of the heifer. Only those exhibiting signs of systemic infection were thrown off feed.

In one herd, during the last 89 days of feeding, the treated heifers which aborted gained 1.75 lb. per day, compared with 1.5 lb. for the nonpregnant, nontreated animals. In a second group of treated animals which aborted, the heifers regained what they had lost during the stress of aborting and added 1.25 lb. per day, over a 60-day period, on a hay and silage ration. This equaled the gains of the nonpregnant, nontreated group. This indicates that there may be some beneficial effect on feed utilization when a comparatively large dose of parenteral estrogen is used, even though it exerts its effect over a relatively short time.

An explosive outbreak of necrotic vulvitis developed after injection of heifers in one feedlot.¹⁰ The lesions were attributed

TABLE 3—Complications Observed in 515 Heifers Which Aborted

Type of complication	No.	Per cent
Retained fetal membranes	39	7.5
Metritis	10	1.9
Prolapse of vagina	7	1.4*
Mummies	4	0.8
Cystic ovaries	4	0.8
Abscesses in uterine horn	2	0.4
Dystocia	2	0.4
Pyometra	2	0.4
Peracute septic metritis (fatal)	1	0.2
Coxofemoral luxation	1	0.2
Herd-necrotic vulvitis	1	0.2

*Responded somewhat to progesterone therapy; **less than 1%; mammary gland development was commonly observed; signs of estrus were not unusual at the scheduled dosage level.

to infected lacerations of the vulvas, inflicted by pigs which were running with the cattle. It was theorized that the estrogens stimulated the glands of the vagina and vulva of the treated animals, and the resulting odors attracted the swine.

Veterinary practitioners in the feedlot areas of Colorado report that, where owners have injected repositol-type estrogens indiscriminately into both pregnant and nonpregnant females, the incidence of prolapse of the vagina and rectum, high tailhead, riding and being ridden, and the resulting injuries is much higher than in this project.

This can be explained by the different effect of the estrogens on nonpregnant heifers. The chief effect in the pregnant animal is development of the mammary gland by synergistic action with the endogenous progesterone and an adverse effect on the conceptus. The physical signs of estrus are masked, or at least inhibited, by the higher threshold of endogenous progesterone and the stress of the pending abortion.

In contrast, the chief effect on the nonpregnant animal is to incite psychological and physical estrus by exceeding the physiological tolerance for estrogen.

According to these data, 64 per cent of the 761 pregnancies in Hereford cattle occurred in the right horn of the uterus (table 2). This agrees with the observations of some,¹⁶ while others⁴ have found that the percentages of right and left horn pregnancies in beef cattle are more nearly equal.

SUMMARY AND CONCLUSIONS

Of 2,760 Hereford heifers examined *per rectum* in 29 feedlots, 761 were found pregnant (64% in the right horn) and were classified as to the month of gestation. Each was injected with Repositol diethylstilbestrol, the dose differing with the stage of pregnancy.

Approximately 80 per cent of those pregnant less than 150 days aborted after one injection of 100 mg., while 89 per cent of 123 that were pregnant 120 to 210 days aborted after a single injection of 150 mg. A dose of 175 mg. did not increase the percentage of abortions in those pregnant 150 days or more.

Effectiveness was somewhat reduced in heifers pregnant more than 210 days. Ap-

proximately 50 per cent of those which did not abort after the first treatment aborted after a second treatment.

The observed incidence of retained fetal membranes was 7.5 per cent, of septic metritis 1.9 per cent, and of vaginal prolapse 1.4 per cent. All other complications occurred at a rate of less than 1 per cent and are insignificant.

Treated heifers which aborted gained as well, or better, than nonpregnant and non-treated heifers on a similar diet.

The discriminate use of abortifacients can provide a valuable service to breeders of purebred cattle, as well as commercial cattlemen. Its use in other species of animals should be investigated.

For a most effective and professional service with the least cost to the owner and fewest side effects, the following are recommended:

- 1) Wait at least 45 days after their exposure to bulls before examining heifers.
- 2) Examine them *per rectum* and classify them as pregnant less than four months, between four and seven months, and over seven months.
- 3) Identify each pregnant animal.
- 4) Inject 100 mg. of Repositol diethylstilbestrol into heifers four months' pregnant, 150 mg. into those over four months but less than 7, but do not treat those more than 7 months' pregnant.
- 5) Do not inject nonpregnant animals.
- 6) Have the owner record dates of all abortions whenever possible and identify animal involved.
- 7) Examine all animals not observed to have aborted at the end of three weeks and re-treat them with the appropriate dose.
- 8) Inject only healthy animals.
- 9) Observe the herd frequently and instigate treatment immediately whenever therapy is warranted.
- 10) Do not allow hogs to run with treated cattle.

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Severe Reactions to Antibiotics

In an exhaustive nationwide survey, it was found that, of all antibiotics, penicillin produced the greatest number of, and the most severe, reactions in man, especially when it was administered intramuscularly. The most frequent reaction was anaphylactic shock, with death resulting in about 9 per cent.

In order of their frequency, reactions to all antibiotics were: shock, superinfections, severe skin reactions, blood dyscrasias, and angioneurotic edema with involvement of the respiratory tract. The most frequent minor reactions were angioneurotic edema and urticaria. Tetracyclines account for most of the severe enterocolitic superinfections—about 75 per cent staphylococci, with a mortality rate of 34 per cent. Aplastic anemia, most frequently associated with the use of chloramphenicol, accounted for 23 of the 27 deaths in the blood dyscrasia group. Angioneurotic edema with involvement of the respiratory tract most frequently followed intramuscular injections of penicillin—5 of 38 cases were fatal.—*J.A.M.A.* (March 22, 1958): 1530.

Unusual Reaction to Chlorpromazine Hydrochloride in a Bitch.—A friendly 40-lb. bitch, 9 months old and in estrus, was given 2 mg. of chlorpromazine hydrochloride

per kilogram of body weight intramuscularly as a preanesthetic sedative. In 45 minutes, she was extremely savage and remained so for eight hours. The next morning, she had regained her friendly disposition so was anesthetized with barbiturates, intravenously. She remained friendly throughout hospitalization. The same technique had been used many times with excellent results.—*J. A. Collard in Austral. Vet. J.* (March, 1958): 90.

Tranquilizers Used in Anesthesia.—Four potentially useful tranquilizers, in order of their descending effectiveness in preoperative sedation, are chlorpromazine, mepazine, promethazine, and diphenhydramine. Use of these compounds permits better preoperative sedation, with less over-all depression, than has the routine dose of narcotics and barbiturates. The tranquilizers, especially chlorpromazine, diminished undesirable reflex activity, reduced the incidence of postoperative nausea and vomiting to a great extent, and reduced or delayed the need for postoperative narcosis.—*J.A.M.A.* (March 22, 1958): 1438.

Pulmonary Moniliasis in Man

Pulmonary moniliasis is usually a slowly progressing febrile disease with night sweats, dyspnea, pleural pain, fatigue, weight loss, persistent cough, and a mucoid, tenacious, gelatinous sputum with the odor of bread or yeast. Usually, the patient does not appear as sick as one would anticipate.

A typical case is described in a woman who had been affected for three months. The diagnosis was made because of thrush on the tongue; repeated culturing of *Candida albicans* from bronchoscopic aspirations, sputum, and stools; failure to respond to antimicrobials; positive agglutination for *C. albicans*; and radiographs showing infiltration of both lungs.

She was given 0.6 Gm. of potassium iodide every eight hours and the next day, for the first time in months, her temperature was normal. Thereafter she had no fever and within a week the chest films improved. She continued this medication for six months and remained well. Three years later, she was still well although radiographs showed no change. However, her agglutination titer for *C. albicans* was greatly reduced.—*Am. Rev. Tuberc.* (Feb., 1958): 329.

Necrotizing Phalangeal Arthritis in Hoofed Animals with Radiographs of Extinct Irish Elk*

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THE SKELETON and its components have several functions. It provides structures for the support of the individual, allows motility, and is one mechanism for environmental adaptation. Tissues of the bony skeleton carry out essential metabolic processes. Information regarding functioning of bones and joints in animals under normal and pathological circumstances has accumulated slowly.

The purpose of this discussion is to present some aspects of bone destruction accompanying necrotizing arthritis in five species of hoofed animals. They are the domestic pig, the horse, and three ruminant species: domestic cattle, sheep, and the extinct Irish Elk, *Cervus giganteus* or *Cervus megaceros*, also called the giant fallow deer.

LITERATURE SURVEY

Bone destruction accompanying necrotizing arthritis in the animal kingdom is well known to those familiar with the hoofed animals. In their daily practice, veterinarians observe the condition repeatedly in cattle, horses, and other species. Naturalists have reported the existence of it in a few species under natural environments. However, there are few written reports regarding animals other than man which describe the condition or discuss the time element involved in bone destruction and periosteal abnormal new bone formation.

A periosteal change in the phalanges of a wart hog, without attendant articulating surface changes, has been reported.¹ Eburnation, porosis, and periosteal overgrowth of the distal digital articulation of the right manus of a red deer is mentioned in the same treatise. The 77 cases of arthritis which were observed included three instances of bone-destroying lesions of phalanges in 3 gorillas. Skeletons of 250 Artiodactyla and 55 Perissodactyla were examined by the above author and observations recorded.

Foot rot in the California deer was believed to

be associated with drought periods.² It was thought that crowding and concentration of the deer at watering places was a contributing factor in this condition. Studies on approximately 700 Columbian black-tailed deer over a period of 15 years did not reveal any digital articulations with extensive destruction and only 2 cases of arthritis in other joints examined.⁴

The commonness of digital arthritis in domestic animals apparently has led veterinarians to neglect reporting this type of lesion. However, the condition in cattle has been studied from a pathological viewpoint. Necrobacillosis of the bovine digit has been discussed.⁶ European writers have reported tuberculous arthritis involving the bovine digital articulations. This literature has been reviewed and a good case history presented.²⁰

The domestic pig often has arthritis associated with *Erysipelothrix rhusiopathiae* infection. However, bone destruction is not the prominent feature of this condition and reference to its presence in the phalanges was not reported.²¹ In a study of pathological changes in pigs artificially infected with erysipelas organisms, 57 proximal phalangeal articulations were examined and gross changes found in only one specimen.¹⁰ In contrast, 17 of 33 tarsal joints and 17 of 33 coxal articulations were found to demonstrate gross changes in the same study.

Arthritis with cartilage destruction has been reported in horses,^{3,8} but extensive bony destruction was long delayed in its appearance. An interesting discussion of this type of arthritis, which in the horse seems more closely related to the rheumatoid types, is presented. A tuberculous lesion in the proximal first phalanx of the horse, which was accompanied by bone destruction, slight involvement of the articulating surface, and lameness, is reported.¹⁷

Foot rot in sheep does not usually involve the deeper joint structures.⁵ The lesion was not mentioned in a description of foot abscess in adult sheep.¹⁴ In a study of foot rot of sheep in Australia, *Fusiformis nodosus* was believed to have etiological significance.¹ "Joint ill" or sup-

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Paper No. 3831, journal series, Minnesota Agricultural Experiment Station, University of Minnesota, St. Paul.

*Irish Elk specimens were provided for study by Dr. Henry Stokes, senior surgeon, Meath Hospital, Dublin, Ireland.

purative polyarthrititis of sheep experimentally induced by injection of *alpha* hemolytic streptococci has been recorded,² but extensive phalangeal destruction was not observed. Minute foci of acute osteomyelitis were found in five of 16 sections taken during this research.

THE EXTINCT IRISH ELK AND HIS HABITAT

The term "Irish Elk" has been applied to a large extinct species, not an *Alces* or elk, but a true deer or *Cervus*, also variously named *Cervus giganteus*, *Cervus megaceros*, and the giant fallow deer. This great deer stood 6 or 7 ft. high at the withers, with the tips of the antlers reaching up to an estimated 12 ft. from the ground. The antlers varied in form and width but several have been found meas-

uring 11 ft. or more at the widest span.

Knowledge of the conditions under which the giant deer lived in Ireland has been greatly advanced in recent years.¹⁰ The species is thought to have reached Ireland, where the largest specimens have been found, by migration from Scotland and the Isle of Man. Remains have also been found in Denmark, France, Germany, Austria, northern Italy, and as far eastward as the caves of Altai in Siberia. It is believed to have migrated westward from Siberia under influence of climatic changes.

Typical deposits in Ireland most frequently yielding giant deer remains are known locally as marl or shell marl, which usually means an open water mud rich in calcium carbonate deposited principally by the plant *Chara*.¹⁰ This calcium rich marl-like mud has provided a desirable environment for preservation of bones and bone structures. The zone 2 of Knud Jessen, in which the remains are most frequently found, is also called the late glacial birch period.^{11,12}

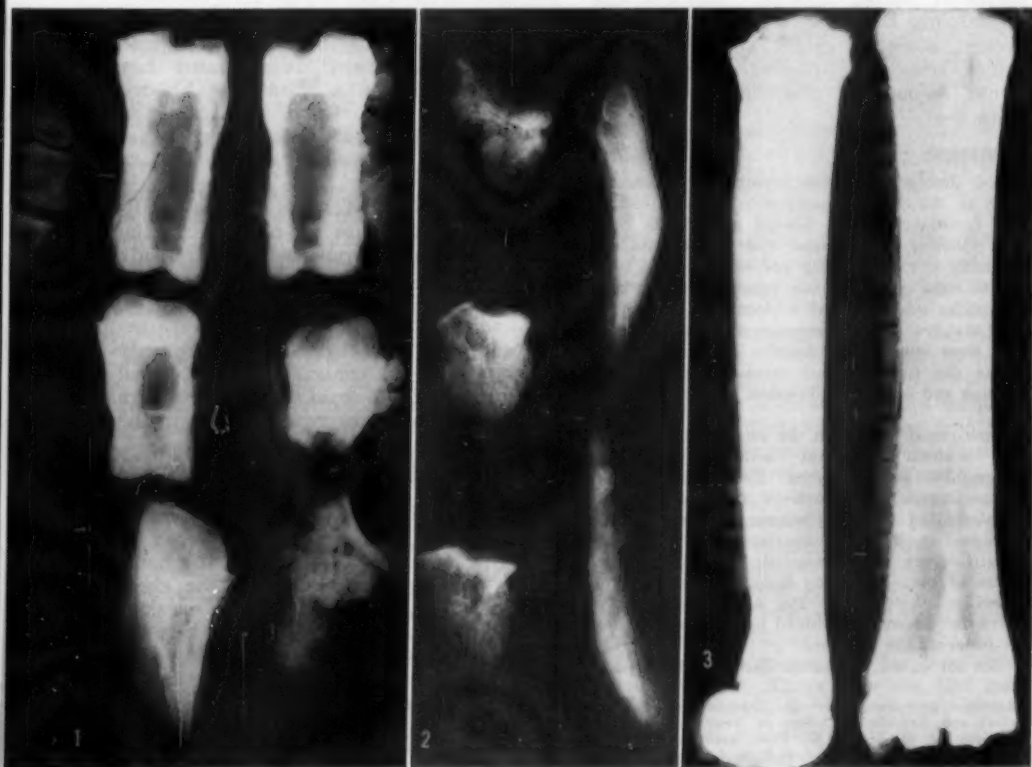


Fig. 1—Radiograph of phalanges of one limb of *Cervus giganteus*, showing bone destruction in area of distal digital articulation. Architecture of this lesion was preserved approximately 15,000 years.

Fig. 2—Radiograph demonstrating some ungual or third phalanges and probable lateral metacarpals of *Cervus giganteus*.

Fig. 3—Radiograph of the third and fourth metacarpals of *Cervus giganteus*, showing periosteal ascending abnormal bone production.

Radiographs of the phalanges of one limb show structures representative of the bones of one intact supporting group of digits (fig. 1). The most prominent lesion presented on the other digit is complete bone destruction involving portions of the second and third phalanx. This process has also destroyed any radiological evidence of an articular cartilage or a smooth joint surface. Lesions of this type in present day domestic species are attended by extensive soft tissue damage, chronic osteos and fibrotic proliferation, and great pain. A foraging animal with this type of lesion is placed under a great handicap.

An alteration in form of the third phalanx is also visible on the radiograph. Many crisscrossing vascular channels lack the normal distribution pattern. These are frequently found when bone is successfully invaded by an infectious agent. There has been an extension of the bony changes to the first phalanx of the affected digit, as evidenced by an extensive periosteal elevation on both lateral phalangeal aspects. There has also been extensive new and abnormal bone formation, with invasion by blood vascular channels.

The opposite digit demonstrates normal bone, intact joint surfaces, and normal vascular patterns in the internal structure of all three phalanges. Calcium depositions are shown in the region of ligamentous attachments in all three phalanges of this digit. Osteophytes of this type are frequently found in cattle at the present time and do not necessarily represent an infectious process.

The phalanges of the second and fifth digits of the giant deer (fig. 2) represent supporting structures for a greater degree of function than those of domestic cattle. This is shown by size and form but in particular by the internal organization of the vascular channels of the third phalanx of these digits. The nature of the connection between these digits and the main weight-bearing digits is not clarified by the radiograph. The articular facet on the proximal end of the elongated bone shown in the same figure tends to place this bone in the metacarpal group.

The periosteal elevation, abnormal bone production, and extensive exostoses present on the giant deer metacarpus are primarily unilateral (fig. 3). These bone changes follow, in general, the expected distribution of circulatory drainage from

a lesion present in the lower limb, such as was shown in the digits, and appear to be the result of a chronic lesion present in the lower digit, with ascending infection following the vascular drainage system. The metacarpal bone shown is not known to be from the same animal as the digits. Similar lesions are also found in domestic cattle, although the stage of advancement demonstrated in these giant deer bones is rarely attained.

The lesions presented are similar to those demonstrated in modern domesticated hoofed animals—lesions which present a poor prognosis and tend to shorten the life of an individual foraging animal.

PHALANGEAL DESTRUCTION IN THE DOMESTIC PIG, *Sus Scrofa*

A Poland China boar, 20 months old, had a period of lameness, starting Nov. 20, 1951, which was attributed to trauma. Treatment consisted of systemic and topical antibiotics.

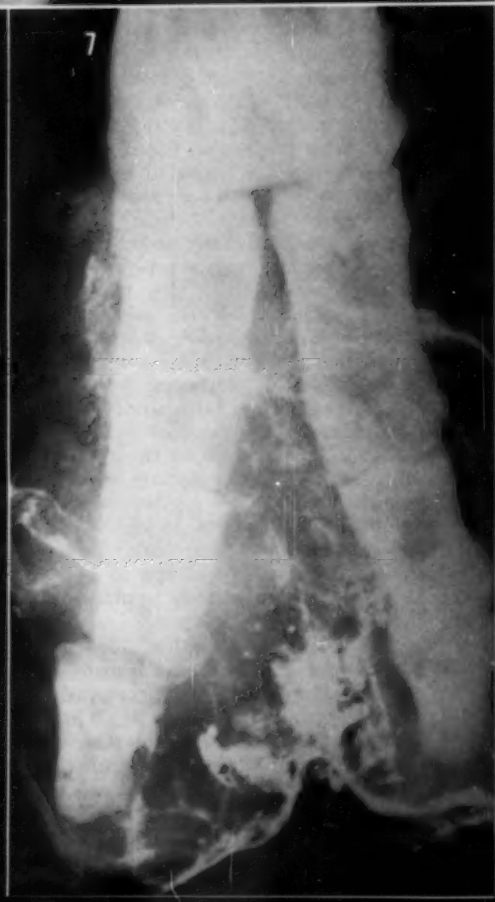
About six weeks later, the boar was not able to rise on its hindlimbs and the joint cavity was discharging synovial fluid. When presented at the veterinary clinic, seven weeks after the initial injury, probing indicated that the distal joint cavity was involved and radiographs revealed extensive bone necrosis and joint destruction in the distal phalangeal articulation (fig. 4). Some abnormal bone production was also evident. The involved digit was surgically removed. The general condition temporarily improved but the boar died a month later and at necropsy there was hydronephrosis, a few renal calculi, and *Brucella* organisms in the testicles.

The relationship between the original lesion and necropsy findings was not established.

PHALANGEAL DESTRUCTION IN THE DOMESTIC HORSE, *Equus Caballus*

Infection of the distal digital articular region in the horse is not a common occurrence, but when it does occur, extreme lameness is immediately evident. If invasion of the joint capsule occurs, the outlook is markedly reduced for functional return and, in many instances, for life itself. Treatment is difficult because of the lack of accessibility of the joint capsule.

A Shetland pony stallion was admitted to the clinic on July 22, 1953. It had been



lame in the left hindlimb since its hoofs had been trimmed and shoes replaced ten days previously, and it had a fever when the shoe was removed four days previously. The pony would bear no weight on the foot. There was a small amount of inflammation at the coronary band and a yellow fluid escaped when the sole was pared.

Two million units of penicillin was given intramuscularly, daily for ten days, and the hoof and adjacent structures were soaked in diluted phenol-formalin solution daily. After 13 days, the limb was markedly swollen to the central portion of the metatarsal region and radiographs revealed extensive pododermatitis and expansion of the distal digital articulation. Daily intramuscular injections of 2 Gm. of dihydrostreptomycin were then initiated and a chlortetracycline ointment was injected into the fistulous tract, demonstrated by radiographs. On August 12, although there was a dry necrosis of the lamina of the sole region, there was moderate improvement and the patient was sent home.

Twenty-seven days later, the pony was readmitted to the clinic, with a discharge from the bulb of the heel. He would place no weight on the foot. Radiographs revealed that the infection had invaded the joint capsule and caused destruction of bone (fig. 5).

After euthanasia, extensive granulosomatous tissues were found in the distal phalangeal joint and continuing with the infection to the sensitive lamina and the fistulous tract to the bulb of the heel. There was periostitis on the navicular bone, some destruction of joint ligaments, and the articulation was almost destroyed.

NECROTIZING ARTHRITIS IN DOMESTIC SHEEP, *Ovis Aries*

Lameness in the left manus of a 2-year-old Hampshire ram was noticed on Oct. 1, 1956, and attributed to a wound sustained

while fighting. He was given sulfamethazine orally (1.5 gr./lb. of body weight), daily for three days, and then presented to the clinic on October 19.

Radiographs showed extensive soft tissue inflammation proximal to the coronary band but the joint surfaces were normal and bone rarefaction was negligible (fig. 6). It was felt that the digit might be saved by controlling the inflammation. Temperature, pulse, and respiration were within normal limits, but the ram showed some discomfort and depression. Extensive granulation tissue was removed from the medial digit but no fistulous tract was found. The digit was bandaged with an iodoform pack and the ram was given dihydrostreptomycin and penicillin therapy for four days.

An abscess which formed on the medial digit was opened and irrigated with tincture of iodine and potassium permanganate solution, and the foot was again bandaged. *Spherophorus necrophorus* and a non-hemolytic *Staphylococcus aureus* were cultured from this abscess. The animal's general condition and attitude seemed to improve but the local lesion was not responding to this line of treatment. Radiographs taken eight days after the first ones revealed necrosis of the bone surrounding the distal articulation and displacement of the third phalanx laterally, indicating that the inflammation was in the joint cavity proper (fig. 7).

The distal half of the second phalanx and the third phalanx were then removed surgically. Bone necrosis was evident in the proximal end of the third phalanx, with destruction of the articular cartilage. The ram was discharged with a slight limp four days later.

PHALANGEAL DESTRUCTION IN CATTLE, *Bos Taurus*

On Oct. 31, 1954, a 4-year-old Shorthorn bull, which had been lame on the right pes

Legends for Pictures on Opposite Page

Fig. 4—Anterior posterior radiograph demonstrating bone destruction near distal digital articulation in a boar, *Sus scrofa*, after seven weeks of lameness.

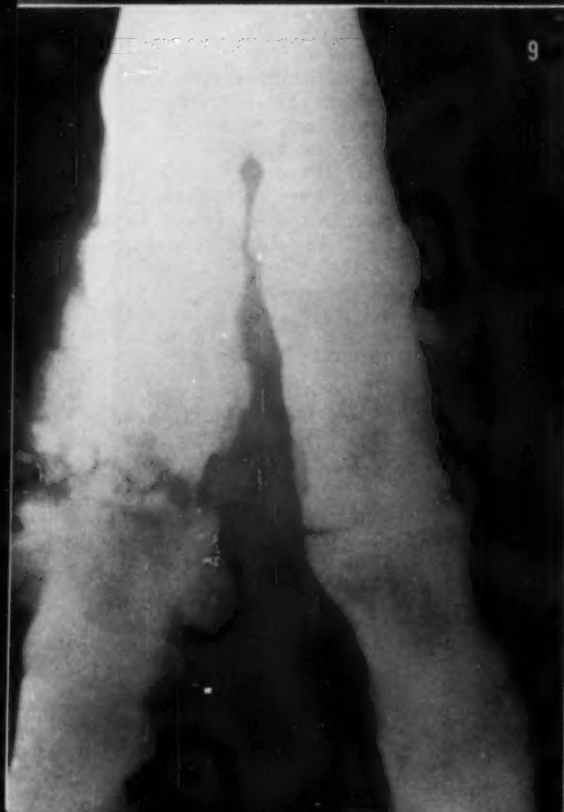
Fig. 5—A lateral oblique radiograph, taken 58 days after improper shoeing, demonstrates proliferative arthritis in a Shetland pony, *Equus caballus*. The arthritis is accompanied by navicular bone destruction and abnormal bone production on dorsal surface of second phalanx.

Fig. 6—Anterior posterior radiograph showing suppurative arthritis in a 2-year-old ram, *Ovis aries*, with joint surfaces intact. The ram had been lame for 19 days.

Fig. 7—Bone destruction in the ram (fig. 6) demonstrated by radiograph taken eight days later.



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for two days, was observed by a veterinarian. Sensitivity was present in the coronary region and the bull was reluctant to place weight upon the limb. A large nail, which was easily removed, had penetrated the soft tissues medial to the third phalanx. Sodium sulfamethazine and sodium sulfathiazole, 100 gr. each, were given intravenously. Five days later, the palpable tissues of the foot were extremely inflamed and the swelling was extending proximally. The puncture wound was curetted to establish drainage. The bull was given three antibiotics.

Seven days later the bull was admitted to the clinic, and after four days of gentling, the initial radiograph was taken. It revealed some rarefaction of bone at the distal articulation, but there was hope that the digit could be saved by conservative therapy. The rectal temperature varied between 102 and 103 F. Following another

Fig. 8—Lateral oblique radiograph demonstrating bone destruction in distal digital arthritis of medial digit in a bull, *Bos taurus*, after 41 days of lameness.

Fig. 9—Anterior posterior radiograph showing bone destruction due to arthritis in proximal interphalangeal articulation of pes. The cow, *Bos taurus*, had been injured 14 days previously.

Fig. 10—Anterior oblique radiograph demonstrating distal interphalangeal arthritis in a bull, *Bos taurus*, which responded favorably to systemic antibiotic therapy.



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three weeks of systemic and local treatment, radiographs revealed destruction of bone, extensive soft tissue swellings, and periosteal new bone formation along all of the phalanges (fig. 8). The medial digit was then removed approximately 5 cm. from the proximal end of the first phalanx. The bull was placed in active service within 30 days and performed satisfactorily until sold one year later.

Another case of phalangeal destruction occurred in a 4-year-old Jersey cow that was admitted to the clinic on Oct. 13, 1953. The dorsal surfaces of both hindfeet had been injured during transportation in a trailer two weeks previously. The trailer gate had worked loose, and the dorsal surfaces of the hoofs were abraded by having been dragged on the ground.

Probing revealed that fistulous tracts extended to the bone in both pastern regions. Radiographs revealed bone destruction at the proximal phalangeal articulation of the third digit in both feet (fig. 9). Extensive periosteal new bone formation was also present. This extensive destruction and new bone formation had occurred within a period of two weeks. The cow was slaughtered since her ability to forage following surgery was questionable.

DISCUSSION

Bone destruction which accompanies suppurative arthritis has an important bearing on the prognosis which can be given animals demonstrating the condition radiographically. In man, suppurative arthritis is much more successfully treated if it is not accompanied by evidences of bone destruction.¹¹

This is also true in cattle when they are observed in sufficient time to allow for effective treatment. In one such case (fig. 10), the bull was effectively treated with antibiotics and, three years later, was still in active service with no visible lesions. However, the ram (fig. 6, 7) and the bull (fig. 8) were treated almost from the outset with present-day systemic and local therapy—yet, in both cases, amputation was necessary.

Time required for development of bone destruction and extra-osseous new bone formation is of importance in radiographic interpretation. In the case of the cow (fig. 9), these events took place in less than two weeks. An interval of three weeks elapsed

between radiographs taken of the Short-horn bull, the first showing almost no bone destruction and the final ones demonstrating extensive destruction and abnormal new bone formation. The rapidity and extent of new bone formation in cattle is remarkable. Radiographs taken eight days apart in the male sheep (fig. 7, 8) also show the remarkable rapidity with which bone and joint destruction takes place in that species.

Time required to develop the ascending exostosis and destruction of the distal digital articulation of the giant fallow deer *C. giganteus* can not, of course, be determined. However, such a lesion could well have developed over a period of a few weeks or months. A remarkable feature of these lesions is the preservation of their architecture over a period of approximately 15,000 years.

SUMMARY AND CONCLUSIONS

Bone destruction accompanying necrotizing arthritis has been demonstrated in five species of hoofed animals, including arthritis of traumatic origin in domestic swine, horses, sheep, and cattle. Bone destruction can be an aid in the prognosis of digital arthritis in domestic hoofed animals. Extensive bone destruction and extra-osseous new bone formation was shown to develop in domestic cattle within two weeks after the initial injury. These changes were readily detected by radiographic observation.

Radiographs demonstrating bone destruction, abnormal new bone formation, ascending exostosis, and osteophyte formation in *Cervus giganteus*, extinct Irish Elk or giant fallow deer, are also presented. Radiographs furnish good evidence of bone destruction and abnormal bone growth even in animal species long extinct.

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More Transmissible Gastroenteritis this Spring.—Veterinarians in Iowa, according to *Wallaces' Farmer* (April 5, 1958: 26), report that transmissible gastroenteritis has taken a heavier toll than in recent years. In one herd, all but 4 baby pigs in 16 litters died, and 2 of 115 shoats weigh-

ing 100 to 150 lb. also died. Since sows that have recovered three weeks before farrowing seem to pass resistance to their pigs, it is suggested that when the disease appears, the sows which will not farrow for a month or more should be deliberately exposed. Sows that have lost their litters apparently can be rebred at their first estrus, with safety.

A Gastroenteritis-like Disease of Pigs in Britain

A highly infectious disease, which affects swine of all ages but causes high mortality only in young pigs, is widely distributed and spreading in Britain. In nine herds, over 500 young pigs have died and 75 have been necropsied.

Swine fever (hog cholera) was suspected in the first herd because of the lesions, including a slight meningoencephalitis in 3 older pigs. However, cholera was ruled out because: the disease was as severe in vaccinated as in unvaccinated pigs; those over 3 weeks old almost invariably recovered; they seldom had a fever typical of cholera; nervous signs were rare; and the incubation period was much too short.

Aujeszky's disease was also ruled out since it is usually marked by severe constipation and by incoordination which progresses to paralysis; also, no signs of Aujeszky's disease developed in inoculated rabbits and embryonating eggs.

Drugs failed to influence the course of the disease which seemed to be identical with the transmissible gastroenteritis in pigs in the United States.—*R. F. W. Goodwin and A. R. Jennings in Vet. Rec. (March 29, 1958): 271.*

Cage-Layer Fatigue.—One result of vertical integration in the poultry business is a leg weakness in laying hens called "cage-layer fatigue." It often occurs in pullets about the time they reach 70 to 80 per cent production. Many will recover if removed from the laying cages but, if returned to a cage, the condition may recur. If not removed from the cages they will die. No lesions of the leukosis complex or other disease have been found in the birds.

The incidence in seven strains of birds varied, at New Mexico A. & M. College, ranging from 0.65 to 3.95 per cent in 13,000 hens.—*Hoards' Dairyman (April 25, 1958): 447.*

Tracheal Obstruction in a Dog

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WILLIAM V. LUMB, D.V.M., M.S., Ph.D.

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On Feb. 29, 1956, a female German Short-haired Pointer, 4½ months old, was admitted to the local hospital in a comatose condition and appeared in *extremis*. The respirations were labored, the mucous membranes pale and cyanotic, and the body felt cool. Foamy hemorrhagic fluid was expelled intermittently from the mouth.

The condition was tentatively diagnosed as trauma to the thorax, and intravenous replacement and shock therapy with Koagamin* and Intragel* was given. In addition, the patient was secured on an operating table, which was tilted with the head downward to allow gravitational drainage of the respiratory tract.

In a surprisingly short time, the respirations became more regular, the color of the mucous membranes improved, and the animal began to show marked improvement. After fluid administration was completed, the patient was placed in an oxygen chamber.

A more complete history revealed that the bitch had appeared normal when let into an enclosed yard in the early morning but, about 30 minutes later, she was gagging and vomiting. In another 20 minutes, she was found prostrate with a pool of blood around her head.

After two hours of oxygen therapy, the animal recovered considerably and was placed in an exercise run, only to collapse again. Oxygen was again administered and a gradual improvement occurred.

The following day, radiographs of the lungs and throat were made while oxygen was being administered. The lung fields were clear, but a round opaque object was apparent in the trachea, just behind the larynx, where its lumen is of greatest diameter (fig. 1). This object had apparently been acting as a ball valve, and tilting the operating table resulted in the sudden relief of dyspnea when the object rolled forward.

It was suggested that the dog be taken

to the Colorado State University veterinary hospital for removal of the foreign object. A small oxygen tank was furnished for use during the trip should the need for it arise.

Severe respiratory distress again developed when the dog was moved from the car into the University hospital. An emer-

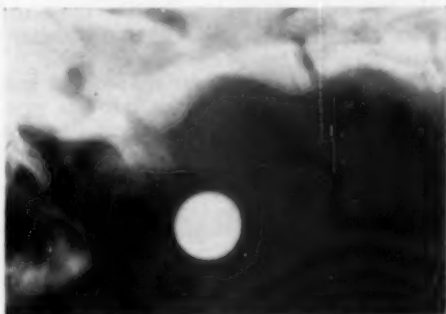


Fig. 1—Radiograph showing a marble in the trachea of a dog, just behind the larynx.

gency tracheotomy was immediately performed, a tube from an oxygen cylinder inserted, and oxygen given intratracheally.

When the respirations became normal, a short-acting barbiturate (Surital Sodium†) was given intravenously. As soon as relaxation developed, a laryngoscope was inserted and the object, a marble, was grasped with Allis forceps and removed. The dog was then intubated, the tube was attached to an oxygen tank, and the tracheotomy incision closed. During the recovery period, a reflex spasm, which was synchronous with the heartbeat,¹ developed in the diaphragm. This disappeared following intravenous administration of 1 cc. of 50 per cent calcium gluconate.

Postoperatively, a combination of penicillin and streptomycin was given intramuscularly. The dog made a rapid and complete recovery.

†Surital Sodium is a product of Parke-Davis and Co., Detroit, Mich.

¹Detweiler, D. K.: Contraction of the Diaphragm Synchronous with the Heartbeat in Dogs. J.A.V.M.A., 126, (June, 1955): 445-448.

Tetanus in Lambs.—On farms where tetanus is common, lambs are frequently affected following surgery, especially when rubber bands have been used for docking and castration.—A. A. Case in Sheep Breeder (April, 1958): 7.

From the Department of Veterinary Clinics and Surgery, Colorado State University, Fort Collins.

*Koagamin and Intragel are products of Chatham Pharmaceuticals, Inc., Newark, N.J., and Fort Dodge Laboratories, Inc., Fort Dodge, Iowa, respectively.

Extirpation of the Preputial Diverticulum of Boars Used in Artificial Insemination

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Unlike other domestic animals, the boar has a pouch, called the preputial diverticulum, dorsal to the preputial os.³

The diverticulum is pear-shaped and has a distinct neck which opens into the prepuce, approximately 3 to 4 cm. caudal from the preputial orifice (fig. 1, 2). The opening

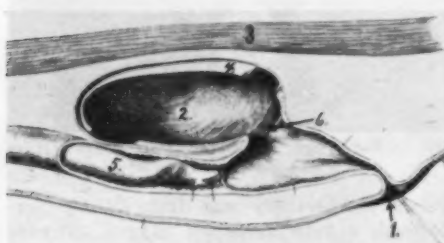


Fig. 1—Drawing of a longitudinal section through the prepuce of a boar, showing the preputial os (1), preputial diverticulum (2), abdominal muscle (3), septum of the preputial diverticulum (4), penis (5), and orifice of the preputial diverticulum (6).

varies in size but usually will admit one or two fingers. The caudal and the widest part of the diverticulum is divided by a longitudinal septum into a pouch on each side, dorsal to the prepuce.

The diverticulum varies in size in boars of the same weight. Usually, its capacity is 20 to 30 ml. but, in a full grown boar, it can hold more than 100 ml.

MATERIALS AND METHODS

The contents of the diverticulum have an intense odor and consist mainly of urine, semen, and desquamated epithelial cells. Sometimes a concretum formation can also be found.

The diverticulum provides good conditions for bacterial growth. The average number of bacteria in 29 living and 8 slaughtered boars was 15.2 million per milliliter, the highest being 100 million and the lowest 175,000 per milliliter. This large

variation is partly due to the conditions in the diverticulum when the sample is taken, since it is washed out during urination, thus reducing the number of bacteria considerably.

While the boar is preparing to mount the dummy sow, the preputial muscles contract and some of the contents of the diverticulum are pressed out. In using the artificial vagina, unless special precautions are taken, some of the contents of the diverticulum can easily be mixed with the semen.

According to our experience, the survival of the spermatozoa depends to a great extent upon a low bacterial content, especially for semen stored at room temperature. By extirpation of the preputial diverticulum, it is possible to make further reduction in the number of bacteria in boar semen than that already made through an effective collection technique.^{1,2}

SURGICAL TECHNIQUE

The instruments needed are the same as for a hernial operation. Chloral hydrate and trichlorethylene are employed as anesthetics.

Before the operation, the diverticulum should be rinsed with a disinfectant or antibiotic solution. After preparing the area, a 5-cm. incision is made through the skin and preputial muscles, parallel with the fibers of the protractor muscle of the prepuce. It is made lateral to and approximately 5 cm. caudal to the preputial orifice (fig. 3). The diverticulum is then carefully dissected free without damaging the diverticulum or the preputial canal.

During this dissection, it is recommended that an assistant keep a finger in the lumen of the diverticulum, with which to orient the operator as to the position and limits of the diverticulum.

When the diverticulum is freed, a large forceps is placed over its neck near the opening into the prepuce. The neck is then cut, inverted, and closed with a continuous catgut suture.

There were no surgical complications and healing was by first intention. The skin sutures were removed after ten days. The mature boars were again used in artificial insemination (AI) 14 days after the operation.

RESULTS

This operation has been performed on 5 boars, 3 of which had been used in AI, while 2 were 3 months old. A litter mate of the latter was used as a control (fig. 5). The young boars entered AI service when 7 months old, but 1 was removed from serv-

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Bacteriological examinations were carried out at the Institute for Hygiene and Bacteriology. The authors thank Steinar Hauge, head, for his assistance.

This investigation was financed by the Agricultural Research Council of Norway.

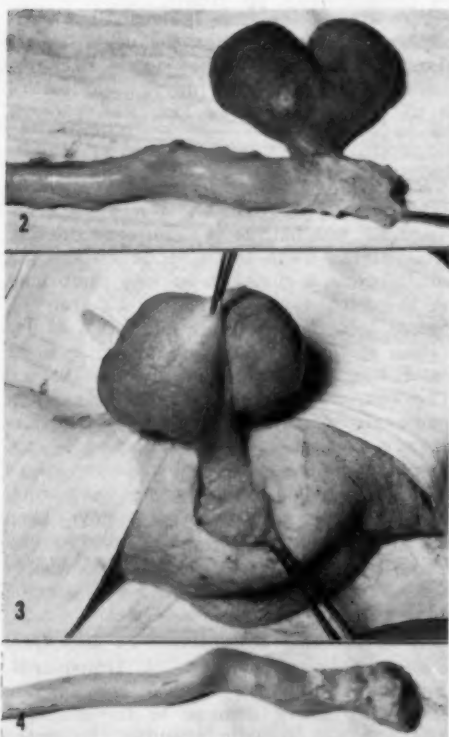


Fig. 2—The excised prepuce of a boar with the preputial diverticulum intact.

Fig. 3—The preputial diverticulum dissected from the prepuce.

Fig. 4—The excised prepuce of a boar three months after extirpation of the preputial diverticulum.

ice because of hereditary defects. The other 4 have been used more than three months, with no evidence that their sexual drive and mating abilities have been affected.

The repulsive odor of the contents of the diverticulum disappeared and semen collection became less disagreeable. There is also noticeably less odor from the stalls where these boars are kept.

Examination of the semen, made before and after extirpation, showed that the bacterial content was greatly reduced after the operation (table 1) even though the technique, equipment for making collections, and the conditions were the same. The number of bacteria in semen of mature boars was reduced by 50 to 80 per cent, and in the young boar it was 30 per cent lower

than in the control boar. Collecting semen was more difficult in the young boar than in mature boars, which may be the reason why the number of bacteria in his semen was higher.

TABLE 1—Comparison of the Number of Bacteria in Semen Before and After Extirpation of the Diverticulum

Boar	Age (mo.)	Before operation		After operation	
		No. of samples	Av. No. bact./ml. semen	No. of samples	Av. No. bact./ml. semen
1	17	6	7,500	6	2,430
2	18	9	7,880	10	1,100
3	18	10	6,930	10	713
4	3	Operated when 3 months old		10	4,985
5	3	10	6,620	....	Control, not operated

When 3 of the boars on which the operation had been performed were slaughtered and the prepuces recovered, the wounds appeared as clean scars showing no reaction or stricture of the prepuce (fig. 4).

SUMMARY

Surgical extirpation of the preputial diverticulum in boars used in artificial in-

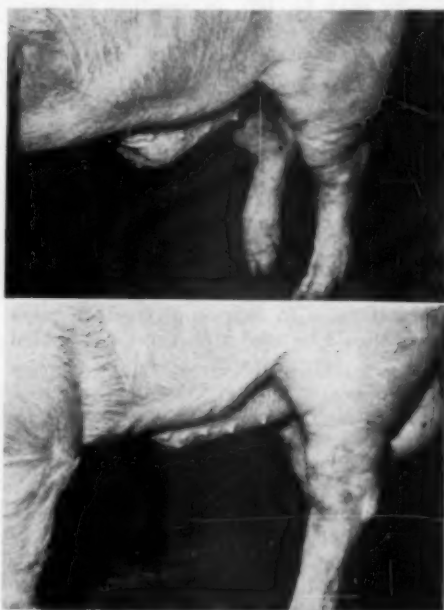


Fig. 5—Preputial contour of boar not operated on (above) and his litter mate after extirpation of the diverticulum (below).

semination is described. As a result, the number of bacteria in semen collected with the artificial vagina was considerably reduced. Semen collection is less disagreeable because the intense odor from the preputial fluid has disappeared. Also, the typical odor in the boar stalls has been greatly reduced.

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²Aamdal, J., Högset, I., Sveberg, O., and Kopang, N.: A New Type of Artificial Vagina and A New Collection Technique for Boar Semen. *J.A.V.M.A.*, 132, (Feb. 1, 1958): 101-104.
³Oehmke, P.: Anatomisch-physiologische Untersuchungen über den Nabelbeutel des Schweines. *Arch. f. wissensch. prakt. Tierheilk.*, 23, (1897): 146-179.

Immediate Closure of Tibial Fractures

The basic objective of the management of an open fracture is its conversion into a closed fracture. The person and wound should receive sound surgical attention, including control of hemorrhage and debridement of devitalized tissue. The soft tissues other than skin should be left unsutured, except at salient points. Fragments of bone with no periosteum or blood supply may be left in position to serve as grafts and scaffolding for new bone, if there is adequate protection against infection.

To overcome tension, one of the greatest deterrents to wound closure, relaxing incisions should be made at a proper distance from the wound. The wound should be closed as soon and as completely as possible. Skin covering offers the best protection for other soft tissues and bone. It prevents reinfection and promotes healing.

Broad-spectrum antibiotics seem to be of most value in compound fracture cases. They should be used until fever has abated. —*Am. J. Surg.* (March, 1958): 415.

A Simple Operation for Prolapse of the Rectum in the Pig.—To avoid obstructive stenosis following amputation of the prolapsed rectum, a candle is inserted into the rectum and held in place by a straight needle inserted through the prolapse. A row of No. 1 catgut sutures is inserted about 1/4 inch from the anal ring; the prolapse is excised 1/8 inch from the line of sutures; and the candle with the prolapse attached is withdrawn. No purse string

suture around the anus is used. This technique is used only when the organ is severely lacerated; in other cases, it is replaced and the purse string, annular suture is used.—*A. H. Pill in Vet. Rec.* (March 29, 1958): 290.

Rupture of Diaphragm with Prolapse of Reticulum in a Cow.—A 4-year-old Ayrshire cow was listless and anorectic the day after giving birth to twins. When she did not improve, a rumenotomy was performed on the fifth day. A hand could barely be forced into the reticulum and, upon exploration of the peritoneal cavity, an annular band was found surrounding that organ. The cow was slaughtered. The reticulum had prolapsed through a rupture in the diaphragm, to which it was attached by unbreakable adhesions. There was no evidence of a foreign body and, despite the normal behavior, the condition must have been present for some time.—*A. J. Adams and D. C. Smith in Vet. Rec.* (March 29, 1958): 278.

Bone Marrow Transplants in Man.—Of 5 patients given marrow cell transplants, four had leukopenia or thrombocytopenia, indicating grave damage to the marrow, and one had aplastic anemia. The donor marrow was obtained by multiple puncture of iliac crests of relatives of the same blood group as the patient. Four parts of aspirated marrow were added to one part of sterile acid-citrate dextrose solution which was injected, as soon as possible, directly into the arteries of four patients and intravenously in one. The transfusion was successful in two; the other three patients died within a few days.—*J.A.M.A.* (March 22, 1958): 1506.

Treatment of Imperforate Anus.—In a study of 60 cases of imperforate anus in infants, the rectum usually opened into the vagina in the female and into the bladder or urethra in the male, although the opening was often minute. The external sphincter ani with its nerve supply develops independently. Surgical correction can be done through an incision in the perineum in the female but a combined abdominal-perineal approach is necessary in the male. The ectopic opening must be closed and the rectum sutured to the skin through the anus.—*J.A.M.A.* (March 22, 1958): 1429.

Isolation of *Leptospira Pomona* from a Bovine Fetus

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THE INVOLVEMENT of *Leptospira* in bovine reproductive disorders was first reported in the United States in 1944;¹ yet the isolation of *Leptospira* from an aborted fetus has been reported only once.² During the past year we have cultured specimens from 20 bovine fetuses for *Leptospira* and we have isolated the organism from one of these. The purpose of this paper is to report this isolation and to describe studies carried out using this organism.

HERD HISTORY

A herd of 80 beef cattle had apparently been affected with leptospirosis for three years. Five of 40 pregnant cows aborted during the 1956 breeding season; 3 had aborted in 1955, and 7 in 1954. Infection apparently produced immunity, since the same cows did not abort twice. The owner reported that all animals that aborted had bloody mucus a short time preceding abortion and retained the fetal membranes following abortion. Hemoglobinuria was not seen in these animals.

Specimens from the cervix and vagina of the 5 cows that aborted in 1956 were cultured and found to be negative for *Vibrio* and other pathogens. Blood samples were taken for serological study for brucellosis and leptospirosis. The brucellosis tests were negative; the agglutination-lysis test for leptospirosis gave titers of 1:100 or over for 4 of these 5 cows. None of the other animals in the herd were tested at this time.

During June, 1957, 2 fetuses, 4½ to 5 months old, were brought to the laboratory by the owner; each had been aborted within the preceding 24 hours. The second yielded a positive culture of *Leptospira* that was identified as *Leptospira pomona*.*

MATERIAL AND METHODS

At necropsy of the fetus, sections were taken for staining with Levaditi's stain, and 0.5 ml. of

thoracic fluid was injected intraperitoneally into a domestic chinchilla (*Chinchilla laniger*).

Blood samples were taken from the chinchilla by heart puncture two, four, and six days following inoculation. Each time a sample was taken, 2 drops of blood was placed into each of two tubes of Chang's semisolid medium, rabbit serum was added to a concentration of 10 per cent, and the medium was incubated at 25 C. At weekly intervals for a month following bleeding of the chinchilla, a drop of the culture was examined under the dark-field microscope.

Leptospiras were found after the cultures made on day 2 were 3 weeks old. This culture was checked for pathogenicity by inoculation of 2 calves. Calf 1, a 3-month-old male, was inoculated with 3 drops of freshly isolated culture on the conjunctiva of each eye. Calf 2, a 4-month-old male, was inoculated with 0.5 ml. of the same culture, intravenously. The calves' temperatures were taken daily. Their urine was injected into chinchillas from which blood samples were later taken, and the blood was cultured in Chang's semisolid medium in the same fashion as the original material.

RESULTS

Leptospiras were found in sections taken from the fetal liver, spleen, and kidney. The chinchilla inoculated with the original material from the fetus had a febrile response to the injection of the fluid; however, it apparently survived the infection and seemed normal until its death three months after inoculation. Sections of its organs stained with Levaditi's silver stain showed a heavy infection with *Leptospira*. Nineteen days after the first blood sample was taken from this chinchilla, the cultures became positive; cultures from later blood samples showed negative results.

Calf 1, inoculated by the conjunctival route, had a febrile response six days later but survived. On postinoculation day 18, urine from this calf was injected into a chinchilla from which a positive blood culture was subsequently obtained.

Calf 2, inoculated intravenously, had rectal temperatures one to six days later of 102.9, 102.4, 102.6, 106.6, 103.2, and 103.3, respectively. The calf refused feed on day 4 and had bloody urine on day 5. Thereafter it appeared to be improving but died on day 7. *Leptospiras* were found in histological sections of the spleen, liver, kidney,

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*Identified by the Leptospiral Research Unit, Communicable Disease Center, Public Health Service, Chamblee, Ga.

and in two capillaries of the left ventricle.

Histopathology of Calf 2.—The adrenal gland was essentially normal; a small cortical adenoma or accessory adrenal was present.

There was massive hyperplasia of reticular cells and polymorphonuclear infiltration of the spleen. Many of both cell types were necrotic, the necrosis often being focal. There was also moderate hemosiderosis and agglutinative red cell thrombi in several capillaries.

In the liver, there were small periportal infiltrations of polymorphonuclear and mononuclear cells, and also foci of necrosis with a few neutrophils, as in the spleen.

There was extensive glomerular and convoluted tubule necrosis of the kidneys, as well as blood and protein precipitate in Bowman's space and tubular lumina. No inflammatory cells were seen.

In the left ventricle, there were edema and widely scattered mononuclear cells beneath the epicardium and among the interstitial spaces.

DISCUSSION AND CONCLUSIONS

The fact that specimens from several fetuses cultured for *Leptospira* showed negative results would mean little if it were not that the tissue sections stained with Levaditi's silver stain showed *Leptospira* in the organs. A possible explanation for the difficulty in isolating *Leptospira* from fetuses is the oxygen requirement of the organism. This organism tends to form a narrow strata of growth about 1 cm. below the surface in semisolid mediums.

It was shown, in 1951, that this stratification of growth is due to strict aerobic requirements of *Leptospiras*.³ On death of the fetus and its separation from the maternal blood supply, the oxygen in the fetus would be depleted to the point where survival would be difficult. This oxygen depletion and the autolytic changes in the fetus following death would result in the death of the organism.

SUMMARY

Leptospira pomona was isolated from an aborted bovine fetus approximately 4½ months of age. The pathogenicity of this organism for the bovine species was demonstrated when 2 inoculated calves became infected. A suggested reason for the difficulty in isolation from a fetus is given.

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- ³Wolff, J. W.: The Laboratory Diagnosis of Leptospirosis. Charles C Thomas Co., Springfield, Ill. (1954): 28.
- Vaccinating Against Leptospirosis.—When 20 gilts, in Illinois, were given *Leptospira pomona* bacterin a few weeks before breeding, and later exposed to infection, all had normal litters, whereas over half of the pigs in four litters from 7 unvaccinated control gilts were dead at birth, due to leptospirosis.—*Successful Farming* (May, 1958): 116.
- Treatment of Ringworm in Cattle
The effects of four antifungal preparations were compared in a group of cattle with extensive ringworm lesions on their heads and necks. The preparations were: (1) a 0.25 per cent solution of isoquinolium chloride; (2) an alcoholic solution of 10 per cent iodine and 2 per cent phenol; (3) a 2 per cent alcoholic solution of dichlorophen; and (4) a 0.1 per cent alcoholic solution of phenylmercuric dinaphthylmethane disulfonate.
The agents were applied to specific zones and another zone was left as an untreated control area on each of 24 animals. Treatments were repeated in four days. Some regression occurred in the treated lesion but the improvement was not maintained. Spontaneous healing occurred, in treated and untreated lesions alike, 150 days after the infection was first noticed and 90 days after treatment.—J. D. P. O'Brien and K. C. Sellers in Vet. Rec. (April 12, 1958): 319.
- Systemic Treatment for Liver Flukes.—In Croatia, a 3:1 mixture of carbon tetrachloride (CCl₄) and medicinal paraffin was injected subcutaneously into the flanks of 140 swine with liver fluke infections. They weighed about 35 to 180 lb., and the dose was 1 to 6 ml. In five days, their feces were free from ova of *Fasciola hepatica*. At necropsy, dead flukes were found in their livers. Doses of up to 2 ml./5 lb. of body weight produced no ill effect except for local reactions. The higher doses were effective against the whipworm also.—Vet. Bull. (March, 1958): Items 796 and 797.

*As reported by the Department of Pathology, School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn.

The Susceptibility of the Chinchilla (*Chinchilla Laniger*) to *Leptospira Pomona*

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THE SUSCEPTIBILITY of various genera and species of the order Rodentia to leptospiral infections of both man and animals has prompted their continued use as laboratory animals in the diagnosis of this disease. Guinea pigs, Syrian hamsters, white mice, and 2-day-old chicks were recently compared as to their susceptibility to infection with *Leptospira pomona*.²

The purpose of this paper is to report the susceptibility of another rodent, the chinchilla, as compared with the guinea pig and hamster, to *L. pomona* and to suggest the use of this animal in the diagnosis of leptospiral infections in cattle.

MATERIALS AND METHODS

Eight young golden hamsters, 8 young guinea pigs weighing between 75 and 125 Gm. each, and 7 adult chinchillas were inoculated intraperitone-

were incubated at 25 C. and examined periodically thereafter for a period of eight weeks.

Tissue sections from various organs and tissues fixed in 10 per cent formalin and stained by Levaditi's silver-impregnation method were examined for leptospires.

RESULTS

In the test reported here, all of the inoculated chinchillas died by the sixth postinoculation day; however, none of the guinea pigs or hamsters died (table 1). Two of the chinchillas died on the second postinoculation day of injuries sustained from fighting. Leptospires were not demonstrated in mediums inoculated with blood from either of these dead animals, but they were isolated from all of the chinchillas that subsequently died. The organism was also isolated from 7 of 8 hamsters and from 6 of 8 guinea pigs.

TABLE 1—Elapsed Time (Days) from Inoculation of Laboratory Animals with *Leptospira Pomona* until Recovery of the Organism in Culture Mediums Inoculated with Blood from Infected Animals

Postinoculation day of blood collection	Chinchilla Animal No.								Guinea pig Animal No.								Hamster Animal No.							
	1	2	3 ^c	4 ^d	5 ^e	6 ^b	7 ^c	8 ^c	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
3	a	a	11	11	11	11	11	—	17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6	—	—	—	—	—	—	—	—	26	26	26	—	26	53	—	25	25	14	25	25	—	—	—	—
14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	31

a = Animal died postinoculation day 2 from traumatic injury, *Leptospira* demonstrated in tissue sections only; b = chinchilla died postinoculation day 4; c = chinchilla died postinoculation day 5; d = chinchilla died postinoculation day 6; e = uninoculated control.

ally with 0.5 ml. of a field strain of *L. pomona* in Chang's³ semisolid medium that had been passed through a guinea pig to maintain pathogenicity. Since previous experience with this strain in the chinchilla indicated it was pathogenic, another uninoculated chinchilla was used as a control.

Blood was taken from each surviving animal by heart puncture on postinoculation days 3, 6, 14, 21, and 28; 1 or 2 drops of blood from each animal was inoculated into each of two tubes of Chang's semisolid medium, to which had previously been added hemolyzed rabbit serum sufficient to make a 10 per cent solution. The cultures

The percentage of recoveries from the three rodent species did not differ materially; however, all of the chinchillas died and showed postmortem lesions characteristic of *L. pomona* in this species.

Leptospira pomona was demonstrated in mediums inoculated with blood drawn on the third postinoculation day from 5 of the chinchillas, only 11 days after the animals were inoculated. However, the organism could be demonstrated from only one tube of medium from a single hamster and from none of the tubes of mediums inoculated with guinea pig blood drawn on the same day and examined postinoculation day 11.

Leptospiemia did not develop as early in the guinea pigs and hamsters as it did

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Approved by the Reading Committee as paper No. 802.

in the chinchillas. *Leptospiras* were recovered from only 1 guinea pig and 1 hamster from the initial blood collection made on the third postinoculation day in contrast to recoveries from 5 chinchillas (table 1).

The second blood collection from the guinea pigs and hamsters on the sixth postinoculation day was the most productive. This collection resulted in recoveries from 5 animals of each of the two species. An initial recovery from a hamster was effected, using blood collected on the fourteenth postinoculation day. The average time required for recovery of the organism in the guinea pig was approximately 27 days, for the hamster 21 days, and for the chinchilla 11 days.

An increase of body temperature of 1 degree, or more, was noted in 4 of the 5 chinchillas that lived longer than the third day and in 7 of the guinea pigs. Pyrexia occurred earlier (av. 1.5 days) in the chinchillas than in the guinea pigs (av. 2.9 days). Body temperatures of the inoculated hamsters were not recorded.

Tissue sections of liver, kidney, adrenal gland, muscle, and other organs or glands of chinchillas stained with Levaditi's silver-impregnation method revealed leptospiras in large numbers, particularly in and around blood vessels. *Leptospiras* were seen in tissues from chinchillas that died on the second postinoculation day, as well as from 1 that died on the sixth postinoculation day.

FIELD ISOLATIONS USING THE CHINCHILLA

Subsequent to this trial for susceptibility of the chinchilla to *L. pomona*, eight isolations have been effected using this animal. The inoculum was urine from 3 calves and 4 cows, and body fluids from an aborted bovine fetus. Each instance in which isolations were made, the inoculated chinchillas died and had lesions consistent with those observed in the test animals.

The only serotype definitely identified has been *L. pomona*; however, one isolate under study appears to be another serotype.³ The susceptibility of the chinchilla to a second leptospiral serotype found in cattle suggests still another reason for the use of this animal in the diagnosis of bovine leptospirosis.

SUMMARY

The results of the comparative test reported here emphasize the greater suscep-

tibility of the chinchilla, as compared with the young guinea pig and hamster, to a field strain of *Leptospira pomona* and suggest the use of the chinchilla in the diagnosis of *L. pomona* infections as a means of reducing the time required for isolation of the organism from the blood or urine of infected animals.

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Pneumonia Virus in Feces of Goats

In areas in Japan where virus pneumonia of goats is common, many goats, both those negative and those positive to complement-fixation tests, excreted large amounts of the virus in their feces for long periods. The major source of this virus was found to be that which had multiplied in the mucous membranes of the intestines. This virus was readily isolated from dust.—*Vet. Bull.* (Feb., 1958): Item 427.

Antibiotics for Foot Rot in Sheep.—*Fusiformis nodosus*, the causative agent of foot rot in sheep, was found to be slightly more sensitive to chloramphenicol than to oxytetracycline. Both, when dissolved in methyl alcohol, were effective in extensive clinical trials, but oxytetracycline (up to 5%) was less stable in practical application than chloramphenicol (10%).—*J. H. Thomas in Austral. Vet. J.* (Feb., 1958): 33.

Cat Scratch Disease and Conjunctival Lesions.—In four of ten children with cat scratch disease, observed in three years, the primary lesion was in the conjunctiva, followed by lymphadenitis of the preauricular node. All were positive to the skin test. Surgical excision of the primary lesion in the conjunctiva appeared to shorten the course. Antibiotic therapy was ineffective.—*J. Am. M. A.* (March 8, 1958): 1251.

Ergot and Ergot-like Fungi as the Cause of Vesicular Dermatitis (Sod Disease) in Chickens

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IN THE WINTER months of 1944 to 1945, vesicular dermatitis, a disease hitherto unobserved in Israel, appeared in several flocks in the Beth-She'an Valley. The following year, the disease recurred on the same farms and spread to additional flocks. Since then, the disease has been observed from time to time on different farms throughout the country.

This disease was first described and named in 1920,² and was subsequently investigated in 1939.¹ No other references to this subject are known to us. The results of studies on the nature and etiology of the disease are presented.

CHARACTERISTICS OF THE DISEASE

The characteristics of the disease, as seen in many affected flocks, can be summarized as follows:

In Leghorns, the early lesions commonly appear on combs and wattles. Small vesicles spread over the area, tending to coalesce into larger ones; the content is a milky-gray fluid. If part of the face is involved, the eyelids may stick together (fig. 1). After the bursting of the vesicles, crusts of a light green color appear on the affected areas.

Recovery takes between three and five weeks but the greatly shrunk combs and wattles never return to their previous size, even during high egg production. Small or large lesions appear on the feet and shanks at the outset or later in the course of the disease. Vesicles which develop between the toes and on the lower portion of the shanks become ulcers.

In young Leghorn pullets, the undeveloped combs and wattles are less commonly affected, whereas the lesions of the shanks and toes may be severe. The same is true of chickens of all ages of the heavy breeds, as well as those of mixed breeds with small combs. The disease was never observed in



Fig. 1—The head of a cock heavily infected with vesicular dermatitis; numerous vesicles are present on the comb and wattles, and the eyelids are pasted together.

chickens less than 6 weeks old. No lesions were found on the undersurface of the feet.

This disease usually attacks younger stock rather severely, causing retardation of development; mortality may reach 25 per cent. Two-year-old birds are less frequently affected, and then in a lighter form. In general, all birds of a flock are not attacked; however, up to 60 per cent may show lesions.

In young laying flocks, egg production may be reduced by 30 to 50 per cent, while mortality generally does not exceed 10 per cent. The diseased birds lose their appetites and often look unthrifty, but their rectal temperatures remain normal. The droppings are greenish and soft and some of the birds have a diarrhea. The duration of

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the disease in an affected flock is one to three months.

Necropsy failed to show a distinctive pathological picture of the viscera but, in 2 heavily affected cocks, the heart was involved. The pericardium was thickened and devoid of fluid. In one specimen, there was a rough white scar on the epicardium, involving the lower half of the heart (fig. 2).



Fig. 2.—Heart of a cock affected with vesicular dermatitis. Notice the rough scar on the lower part of the epicardium.

A similar lesion in the other specimen was limited to the apical region only. The incised lesion was bright yellow to a depth of 2 to 3 mm. Histologically, this section of the muscle was necrobiotic, with overgrowth of fibrous tissue. Because of the relatively small number of heart lesions observed, we hesitate to designate those changes as pathognomonic of the disease.

EXPERIMENTAL PROCEDURE

In view of the statement that the disease was caused by a white *Micrococcus*,¹ the following attempts were made to produce the disease by contact and by different ways of inoculation.

Six heavily infected birds were taken to our laboratory for experimentation. The sick birds were housed together with 12 White Leghorn (WL) cockerels, 3 months old. The 6 diseased birds recovered fully within three weeks without treatment; none of the cockerels developed any sign of the disease.

A few vesicles were cleaned with alcohol, punctured with sterile syringe needles, and vesicle fluid was collected and cultured on broth agar and MacConkey's medium. After 24 hours' incubation, a miscellaneous bacterial population had developed. A strain of white *Micrococcus* colonies, conspicuous in all the cultures, was obtained in pure culture from two vesicles.

With a small brush, a heavy suspension of the isolated microorganism was rubbed into one side of scarified combs and wattles of 10 WL cockerels, 3 months old, and 10 hens, 1 year old. Intradermal and subcutaneous inoculations of the bacterial suspension, 0.1 ml. each, were made into the other side of the combs and in the other wattles. The legs and toes of the same birds were pricked with a needle and the spots rubbed with a brush dipped in the bacterial suspension. During the following month of observation, none of the treated birds showed any signs of the disease. Bloody scabs developed on the scarified combs of 2 birds but healed in a few days. These scabs bore no resemblance to those typical of the disease.

At the same time, another group of 10 cockerels and 10 hens of the same age were treated in the same manner but with a suspension of crushed vesicle detritus taken from 3 affected birds. No ill effects were seen during one month of observation.

Ten WL cockerels in another group were treated with injections of blood taken from sick birds, 1 ml. intramuscularly and 1 ml. intraperitoneally, but all remained healthy during the subsequent month of observation.

After the total failure of the above transmission experiments, the direction of our investigation was changed toward nutritional toxicology.

The distinctive gangrenous lesions appearing on the peripheral organs, such as combs and feet, invited comparison with ergot intoxications in man and animals. Therefore, it was decided to investigate the feed consumed by the affected birds for ergot-producing fungi and, simultaneously, to conduct an experiment in ergot-feeding.

An ergot powder, containing 1 per cent of alkaloids, was given to 5 WL cockerels, 3 months old, and to 5 WL hens, 10 months old. Boluses containing 1 Gm. each of ergot powder were fed individually to each of the birds twice daily. Between days 12 and 18

of ergot-feeding, more or less typical vesicular lesions of the comb and wattles developed in all 5 cockerels and in 2 of the 5 hens, but foot lesions were observed in only 2 of the cockerels. The remaining 3 hens showed purple combs and loss of appetite, and stopped laying. One of the affected cockerels died on day 20 of the 24-day experiment, but no gross lesions of the organs were present.

On visiting three affected poultry flocks in the same area, we found that all were being fed local wheat salvage that contained a variety of weed seeds. It was the only grain fed whereas, previously, barley and imported maize had been fed.

Although no *Claviceps* fungi were seen in the wheat salvage, we performed a preliminary laboratory test with 4 WL cockerels, 3 months old, which were fed the suspected wheat salvage, ad libitum, for four weeks.

Two of the 4 birds became seriously affected after days 18 and 20 and vesicles of the combs diffused rapidly. A third cockerel showed a slight lesion between the toes of the right foot.

A 100-kg. sample of wheat salvage from one of the affected farms was separated into its different seed components and each lot was individually weighed. The 13 differ-

ent species of weed seeds which were found were identified botanically* as: *Lolium temulentum*, *Rapistrum rugosum*, *Cephalaria syriaca*, *Galium tricornis*, *Lavatera cretica*, *Phalaris paradoxa*, *Bupleurum lancifolium*, *Cathamus tenuis*, *Centaurea iberica*, *Malva*, *Brassica nigra*, *Sinapis arvensis*, and *Ranunculus eigi*.

Lolium temulentum seed was found to be the most prevalent, 5.65 kg. being culled from the lot, compared to 50 to 720 Gm. of the remaining weed seeds. Closer examination of the *Lolium* seeds revealed that the majority were covered with *Cladosporium herbarum*, a saprophytic fungus sometimes parasitic of decomposed seeds and herbs.

Consequently, an experiment was carried out with *L. temulentum*, in which 4 WL cockerels, 3 months old, and 4 hens, 1 year old, were fed *Lolium* seeds, in addition to their regular ration, at the rate of 20 Gm. and 40 Gm. per bird, daily, for 24 days. Small vesicles appeared on the combs of 2 broilers after seven days of feeding and developed into characteristic lesions during the next four days. These 2 birds developed ulcerative lesions between the toes after 15 and 18 days of feeding. A third broiler had shown smaller lesions on one side of the

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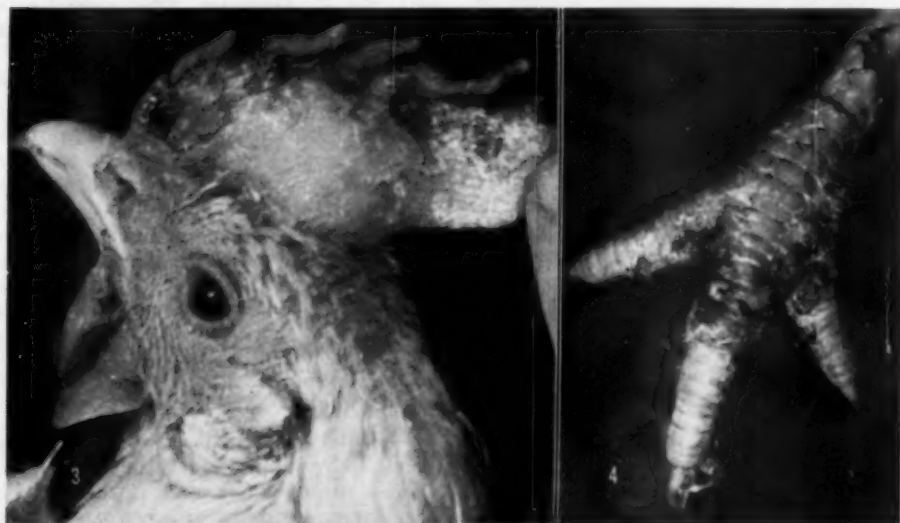


Fig. 3—A White Leghorn hen with a large vesicle on the comb, induced by feeding *Lolium temulentum* seeds infested with *Cladosporium herbarum*.

Fig. 4—Shank and foot lesion on a hen, caused by feeding *Lolium temulentum* seeds infested with *Cladosporium herbarum*.

comb after 14 days but did not develop any other lesions.

Of the 4 hens, 2 developed characteristic lesions on their combs after 18 and 20 days (fig. 3). Severe lesions of the legs and toes developed in only 1 hen (fig. 4), the other remaining unaffected. The remaining 2 hens ceased laying after ten days and showed light cyanosis on their combs. In the last week of feeding, the appetite of all the birds was much reduced and they consumed only part of the *Lolium* seeds given to them.

The 15 cockerels which served as controls were fed on the separated wheat, 20 Gm. daily per bird, and none was affected.

In another 100-kg. sample of wheat salvage bought from a feed merchant, no *C. herbarum* was found on the *Lolium* seeds. From this salvage we selected 6.2 kg. of *Lolium* seeds which were fed to 4 WL cockerels and to 4 hens as in the previous experiment. None of the birds showed any signs of the disease during the 30-day experiment.

DISCUSSION AND CONCLUSIONS

Although the character of the disease seemed to be noninfectious, we repeated some of the experiments done in 1939 in the United States,¹ and likewise failed to produce the disease, either by contact or by the intramuscular and intraperitoneal injection of blood from affected birds.

We isolated a strain of *Micrococcus pyogenes albus*, which had been believed to cause the disease, from all the vesicles of 6 birds, 2 of them in pure culture. However, we failed to produce the disease with this organism either by introducing suspensions of cultures or by rubbing suspensions of crushed vesicular detritus into scarified combs and wattles and into the pricked legs and toes of healthy birds.

Since *Micrococcus albus* is known to be a normal inhabitant of the skin surface of man and animals, and seldom pathogenic, we presume that microorganisms isolated from the vesicles were secondary invaders. The failure of our transmission experiments indicates that they are not of etiological significance in the disease.

When the disease, as found in Colorado, was first described,² there were no conclusions about its character. Different causes, such as chemicals, sand, sun, ants, cactus, sod, and infections, were suggested, but

without evidence to support these assumptions. A coccus and a bacillus were isolated but neither produced the disease by inoculations into healthy birds. The experiments seemed to point conclusively to the association of the disease with sod.

Our feeding experiments with ergot powder showed that 7 of 10 birds developed lesions characteristic of the disease.

Lolium temulentum has been described³ as a troublesome weed in Egypt, due to its toxic properties. It contains an acid, "temulin," injurious to man and animals. It also contains a glucoside to which poisonous properties have been ascribed.

Experimentation with *Lolium* seeds infested with *C. herbarum* enabled us to produce the typical lesions of vesicular dermatitis in 5 of 8 chickens. However, we could not produce the disease with *Lolium* seeds that were not infested with this fungus. Therefore, we can not ascribe the toxic effects to sound *Lolium* seeds.

It is highly possible that *C. herbarum* in itself is nontoxic but, as a parasite of *Lolium* seeds, it may either decompose the seed—thus causing the seed to acquire toxic properties—or it may serve as an indication of already decomposed seeds. It has been pointed out⁴ that *L. temulentum* possesses an ergot-like toxicity if infested with the *C. herbarum*. Our experiments with infested and noninfested *Lolium* seeds confirm these views.

It was impossible for us to investigate all possible causes of the many cases of vesicular dermatitis in Israel, but we may presume that ergot-producing fungi or those with ergot-like properties could be the cause of the disease.

The author has found many fields of irrigated *Paspalum dilatatum* grass to be heavily affected with the ergot-producing fungus, *Claviceps paspali*, which was toxic to grazing cattle.⁵ Further investigations in this direction are being conducted.

SUMMARY

Vesicular dermatitis of chickens was produced by feeding ergot to healthy birds. *Lolium temulentum* seeds, infested with the common fungus *Cladosporium herbarum*, had an ergot-like action and vesicular disease resulted when they were fed to chickens. The disease could not be produced

by *L. temulentum* which was not infested with this fungus.

Micrococcus pyogenes var. *albus* strains isolated from the vesicles of affected birds did not produce the disease.

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Calcification of Arteries in Young Cattle—Case Report

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From approximately 75,000 cattle of various ages, breeds, and sexes examined at postmortem meat inspection, I have observed marked calcification of large arteries in 3 animals, all beef-type cattle 12 to 18 months old. All were in good nutritional condition.

The latest case (fall, 1957) was in a 15-month-old Hereford heifer which seemed entirely healthy at the routine antemortem inspection. All parts of her carcass appeared normal except for bonelike rigidity of some large thoracic blood vessels. Closer examination revealed that a solid calcification made the affected vessels appear like stiff pipes with almost no elasticity.

The following arteries were involved: (1) the arch of the aorta from the base of the heart for approximately 30 cm.; (2) the common brachiocephalic trunk throughout its length of about 10 cm.; (3) the pulmonary artery from the conus arteriosus to its division into right and left branches; and (4) a pair of aortic intercostal arteries for about 2 cm. dorsally from their emergence.

The anterior cusp of the bicuspid valve contained calcified plates. The solidly calcified portion of both the aorta and brachiocephalic trunk was succeeded by portions

containing irregularly shaped, mostly square and convex polygonal calcified plates of approximately 25.0 to 75.0 sq. mm. and 1.0 to 1.5 mm. thick. The calcification, whether solid or in plate form, involved the media only. No macroscopically detectable changes were noticed in the intima, except goose fleshlike elevations which were commonly observed on the intima of the aorta in cattle.

DISCUSSION AND CONCLUSION

It would have been interesting, had it been feasible, to trace the origin of these cattle to study the breeding and management practices on the respective farms or ranches, and to check on the postmortem findings of other cattle from these sources. Such investigations might have furnished some leads as to the possible cause of this condition.

It seems remarkable that calcification of the media of these large blood vessels occurred only in young cattle, their age corresponding to the adolescence period in human beings. All presumably had been on full feed to obtain maximum weight gains in the shortest time possible.

Since only advanced cases of this condition are detectable during the procedures employed in routine meat inspection, the incidence given in this report can not be considered a true reflection of the frequency of such lesions in domesticated cattle. Well-planned and systematic observations of this kind possibly might produce surprising results.

Nematodirus in Lambs.—Infection with *Nematodirus* species is recognized as a lamb-to-lamb disease, each crop of lambs deriving the major part of its infection from pastures infected by the previous year's lambs. Infection from eggs passed by ewes in the same year is of much less importance.

The majority of eggs are deposited on pastures in the early summer and the maximum number of infected larvae are found on the grass the following year from January to May, depending on the season. The development of infective larvae is assisted by temperatures below freezing.

Infection can be reduced by keeping lambs off pastures grazed by lambs the previous spring, at least until late summer.

—C. R. W. Spedding et al. in *Vet. Rec.* (March 15, 1958): 229.

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Some Research Contributions on Canine Distemper

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CANINE DISTEMPER is the most serious infectious disease of dogs. It may be a trivial illness of little consequence or a severe infection which terminates in death.

SURVEY OF THE LITERATURE

The disease was first accurately described in 1809.²³ With the recognition of bacteria as disease-producing agents at the close of the nineteenth century, each investigator who isolated a bacterium from dogs with clinical cases believed that it was responsible for the disease. In 1905, it was found possible to produce distemper in dogs with a filtrate which did not contain bacteria.⁸ This finding was not generally accepted until 1926.

In 1911, two independent investigators^{11,12,28} announced that *Bacillus bronchisepticus* caused distemper. Their views prevailed in most quarters until 1926 when Laidlaw and Dunkin^{9,10,26} showed that a virus was the primary cause. Bacterial organisms play an important role in the clinical syndrome as secondary invaders, but they are opportunists and alone they can not produce distemper.

Because of the divergent views and the irregular results of studies with dogs collected at random, these workers realized that a disease-free dog colony was essential for successful research on diseases in dogs. This involved considerable capital for construction and maintenance and appreciable delay in experimental work. Due to their excellent results, we all now realize the vast importance of raising disease-free animals for research studies.

Furthermore, with dogs that were in excellent condition and maintained in isolation after inoculation, it was possible to study distemper in its simplest form, uncomplicated by secondary infections. This experimental procedure was probably their greatest contribution to science. This is a broad statement when one considers their many contributions in virology.

They gave us the classical picture of dis-

temper in dogs as an acute, contagious disease characterized by an incubation period of three to six days, a coryza, a diphasic temperature curve, severe gastrointestinal disturbance, a variable set of signs of illness due to inflammation in the respiratory tract, and nervous manifestations in a small percentage of cases. Vesicopustules, when they occur, are due to secondary bacterial infection. No characteristic lesions were found at necropsy even when respiratory signs of illness were observed, and definite bronchitis or bronchopneumonia did not occur in these experimental dogs. Bronchitis or bronchopneumonia can occur in natural cases.

Subsequent studies by many investigators have shown that distemper produces a monophasic leukopenia, usually followed by a leukocytosis.

Most of our experimental pups less than 2 months of age had no febrile reaction but, 12 to 21 days after inoculation, they collapsed and died. These dogs became weak as a result of anorexia, vomiting, and bloody diarrhea.

The inclusion bodies associated with distemper infection were first described in 1907.²⁰ Others^{21,29} confirmed and extended this finding. The histological lesions occurring in dogs with the nervous form of distemper were described¹⁰ as a varying degree of nerve cell damage widely scattered in the brain, without evidence of an inflammatory reaction; however, whenever fits were observed, the affected animals were immediately destroyed.

Ferrets, in which distemper virus usually causes a fatal disease, were used as experimental animals,⁹ and methods of protecting dogs by use of hyperimmune serum²⁸ and by vaccine-virus inoculation for active immunity were devised.²⁷

Except for virus-modification studies in dogs with ferret virus,¹⁸⁻²⁰ there was little advance with distemper research until 1947, when results of studies on infectious canine hepatitis virus in dogs were published.²⁵ This disease undoubtedly had been masquerading under the name of distemper and explained some, but not many, of our immunization failures. Three years later,

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inclusion bodies of both distemper and infectious hepatitis were found in a dog that died from an illness attributed to distemper virus.³¹ It was found³⁷ that inoculation of mixed distemper virus and infectious canine hepatitis virus produced a more severe type of illness than either virus alone. Both viruses were present in the blood during the acute phase of illness, inclusion bodies of both were found, and immunity against both viruses developed. Subsequently, it was shown^{33,37} that dogs could be successfully vaccinated against both diseases by a mixture of these viruses.

In 1948, hard pad disease of dogs was described as a separate entity characterized by hard pads and encephalitis.³² Although the disease was similar to the nervous form of canine distemper, these investigators felt there were enough differences to consider it a separate entity. Others have disputed this view and consider it a form of canine distemper.^{2,6,13,16,25,29,34} The conclusions of the latter investigators are based on cross-immunity studies in dogs with hard pad strains and classical distemper strains, and also by serological methods.

There has been some controversy as to whether distemper virus can produce encephalitis. The Snyder Hill strain of distemper virus that has been adapted to brain tissue of dogs regularly produces nervous manifestations and death, and histological studies of affected dogs showed an encephalitis.^{13,16} Other distemper virus strains also produce encephalitis.^{3,34} Dogs that recover from distemper are fully immune to intracerebral inoculation with Snyder Hill strain.^{6,10}

In recent years, ferret-passed viruses have been successfully transferred in chicken eggs,^{7,22} resulting in modified virus vaccines which have been reasonably successful in controlling distemper.

The use of the egg distemper virus for detecting serum-neutralizing antibodies in the embryonating chicken egg was reported in 1951.⁸ Others^{1,14,24} have used this method, with slight modifications, to study this disease. This test has done much to enhance our studies of immunity to distemper in dogs.

Failures in immunization usually are attributed to infection with another disease agent or the ineffectiveness of the biological product. Too little emphasis probably has been placed on the role of the host in the production of immunity. In recent

years, there has been considerable research on this subject.^{14,38,40}

EXPERIMENTAL STUDY

In our studies, two methods were used to evaluate the response of distemper in dogs.¹⁴ The serum-neutralization test in embryonating chicken eggs was used to measure the amount of neutralizing antibody in the serum and colostrum of dogs. This test was specific and also accurate if the amount of virus used in the test was standardized.

Immunity was also determined by use of Snyder Hill test strain. This strain has been compared by cross-immunity tests in dogs with other strains of distemper virus, including the Buffalo strain which was isolated from a dog with hard pad disease and encephalitis. These strains protected against themselves and each other. All the dogs were kept in isolation during experimentation.

The age at which we can successfully produce an active immunity in dogs was determined by maternal immunity studies.¹⁴ Our experiments showed that antibodies are transferred *in utero*, as well as in the colostrum, with the major transfer by colostrum consumption. One day after parturition, the neutralizing antibody titer in the serum and colostrum of the immune mother and the serums of her progeny were approximately at the same level. Twelve weeks later, the serum titer of the mother had not changed. In contrast, the antibody titer in the milk of a bitch with a high serum titer showed a marked drop two days after parturition and had a gradual decline in titer until the fifth week, when the titer was low. Some pups from a bitch with a high serum titer had antibodies until 12 weeks old, while pups from an immune mother with a low serum titer had little or no serum titer at 3 weeks.

Approximately 70 per cent of the progeny from mothers with varying degrees of immunity did not show signs of illness when given virulent virus at 5 weeks of age. Furthermore, these pups did not develop an active immunity and they became susceptible later. The other 30 per cent showed signs of illness and the survivors developed an active immunity.

Even though the majority had some serum-neutralizing antibodies when inoculated with virus at 8 weeks of age, the majority showed signs of illness and all pups

developed an active immunity. The group inoculated at 12 weeks of age had negative or exceedingly low serum titers and all showed signs of illness and developed an active immunity. In general, each of three different age groups responded equally well to inoculation with virus 28 days after inoculation. All dogs were given a second inoculation with virulent virus four to seven weeks later. Pups that did not develop an active immunity to first inoculation showed signs of illness and developed an active immunity. The others remained normal after injection.

DISCUSSION AND CONCLUSION

Thus, active immunization can not be started for most pups until they are 8 to 9 weeks old.¹⁴ On the other hand, if the pregnant mother's serum titer is determined, it becomes possible to predict the age at which antibodies in her progeny would no longer protect and when the pups would become susceptible and could be immunized.

Until further studies are made evaluating the antigenicity of egg virus, we recommend that pups should be 9 weeks old before they are started on a program of active immunization. Apparently, dogs must become susceptible before an active immunity can be produced. This period of susceptibility must be kept small by passive immunization. If anti-canine distemper serum is used in 5-week-old pups, it should be repeated every seven days and active immunization must not be started until two weeks after the last serum injection. Modified egg virus vaccine is recommended for active immunization, but there have been some immunization failures after its use in susceptible dogs.

Recent studies⁴ have shown that 1,000-egg infectious doses of avianized distemper virus at the forty-fifth to fiftieth egg transfer are required to immunize dogs. This vaccine rarely produces any signs of illness in dogs and usually elicits a good antibody response. The duration of immunity produced by egg virus vaccine under field and experimental conditions is now under investigation.

The effects of virulent virus on pups from susceptible dams and pups from immune dams were compared.¹⁵ The mortality of those pups from susceptible dams was exceedingly high when virulent virus was given at 6 to 10 weeks of age. A less severe

infection occurred in their litter mates when, at 12 to 16 weeks of age, they were given the same virus and kept under similar conditions. The majority of pups less than 10 weeks of age and from mothers immune to distemper showed no signs of illness when given the same virus, but those over 12 weeks of age developed signs of illness similar, in degree of severity, to pups from the susceptible mothers.

Research methods and knowledge gained in the study of distemper have been successfully applied in the study and control of other infectious diseases. There is still much to be learned about distemper infection in dogs, and we believe that most of it will be accomplished by research under controlled conditions with disease-free dogs.

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Vaccinating Mink Against Distemper and Botulism.—Because a report from Germany indicated that poor immunity against distemper resulted when minks were vaccinated simultaneously with live virus distemper vaccine and type C botulinum toxoid, an experiment was conducted with 20 ferrets. Groups of 4 ferrets were given the toxoid four days before, four days after, or simultaneously with the distemper vaccine, and 4 were given distemper vaccine alone. All of these survived and showed no signs of distemper when challenged three weeks later, whereas those given the toxoid, only, showed signs of illness on the eighth day after challenge and all 4 were dead by the fourteenth day. (This supported Dr. J. R. Gorham's experience.)—*Fur News* (April, 1958): 10.

Edema Disease in Swine.—Ten of 96 pigs, 10 to 12 weeks old, were diagnosed as having edema disease. They had been given anti-hog cholera serum on July 26, 1955, then shipped to New York State and given hog cholera virus two days later. On August 4, 3 were prostrate and 7 were ataxic, swaying in the hindquarters, with knuckling at all fetlocks. Only 1 had an excessive temperature (105.4 F.).

On necropsy, 3 of 4 showed an accumulation of clear gelatinous fluid, up to ¾ inches in thickness beneath the mucosa of the cardiac region of the stomach, and 1 of these showed edema of the colic mesentery.

One prostrate pig was given 8 oz. of Epsom salts, another was given 1.5 oz. of castor oil, and the next day each was given 250 cc. of 5 per cent dextrose subcutaneously and 400 mg. of streptomycin intramuscularly. Both made progressive improvement and were normal in five days.—*Vet. News, N. Y. State V.M.A. (March, 1958): 28.*

Nutrition of the Cat

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THERE IS little in the literature regarding feline nutrition. The reason for this may be that the domestic cat has thrived well on diets derived from the family table, as well as from its inherent ability to roam and hunt.

However, with the increasing confinement of the cat as a family pet and the resulting trend toward a more restricted diet, it is becoming necessary to obtain more specific knowledge of the cat's basic nutritive requirements. Many clinical conditions that the small animal practitioner sees in cats might be traced to a dietary deficiency.

DIETARY REQUIREMENTS

Protein.—Since the cat is a carnivorous animal, one could assume that it requires a diet high in protein. The retention of dietary nitrogen is dependent, in part, on the caloric intake which, in turn, varies with the size, activity, and species of the animal. The caloric requirement is considerably higher during the early growth period. Young cats have been shown to require about 160 calories per kilogram of weight per day—about twice the requirement of adults (80/kg./day).¹

Recent work has shown that, consistent with this high caloric demand, protein requirements are also relatively high.¹ The pattern of amino acids found in casein is better adapted for anabolism in the cat than in other animals.¹ Approximately 0.36 Gm. of casein nitrogen is needed to maintain equilibrium.¹ Beef protein also seems to have a high index. An experiment with kittens showed that a mixed diet containing 30 per cent protein or less was inadequate for proper growth and development.⁴

Vitamins.—Available information indicates that the vitamin requirement of the cat is similar to that of the dog. A high content of vitamin B complex seems to be essential in the feline diet. Cats were shown to develop irreversible nervous

symptoms when fed exclusively on canned foods based on whole or filleted fish.⁷ The damage to the nervous system may be due to a deficiency of thiamine. Niacin is an essential component of the diet⁶; however, the cat, unlike other animals studied, seems to be unable to effectively convert tryptophan into niacin.²

As in the dog, ascorbic acid (vitamin C) does not seem to be required in the diet.⁶ In the normal, healthy cat it is apparently synthesized in the body. The need for vitamin A is not fully understood but all indications are that it is undoubtedly a dietary essential. Some workers consider a deficiency of vitamin A to be associated with problems of the urinary system in cats.⁸ Although no data were found concerning the importance of vitamin D in the diet, there were several references to rickets in young kittens. Vitamin D may be as important for cats as for all other animals.

Death of 1 cat due to "yellow fat" disease is reported.³ This condition has been reported in mink and swine and has been produced experimentally in rats and chickens. The diets of the cats involved were found to be low in vitamin E.

General.—Several commercial cat foods consist almost entirely of fish. Also, cats are frequently fed largely on fish diets from other sources. Some consider the "high ash" content of fish diets as a factor in the high incidence of urinary calculi formation seen in cats; however, other investigators are not in complete agreement. A low ash diet was found essential for both the prevention and treatment of urinary calculi.⁷ On the other hand, in feeding 50 cats for 33 months on a canned fish diet, there seemed to be no tendency toward the formation of vesical calculi.¹⁰ This problem warrants further investigation.

Another question is whether the cat requires a certain amount of raw food in its diet. The prevailing opinion seems to be that some raw food, if not essential, is definitely beneficial. However, recent work indicates that canned diets can be just as nutritious as raw meats, provided they are properly formulated and processed.⁷

Experiments and surveys on the palata-

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Prepared in cooperation with the American Association of Veterinary Nutritionists.

bility of various foods for cats indicate that most cats show an instinctive desire for fresh liver, which might be explained on the basis of their great need for vitamin B complex. Beef kidney is also a highly palatable feline food.⁹ Cats like variety and tend to choose a new ration in preference to one which they have been fed for a time. Certain foods of high acceptability were nutritionally inadequate, while others, considered nutritionally adequate, had a low acceptability.⁵

CONCLUSION

Little experimental work has been done on the dietary requirements of the domestic cat, and much of what has been done is inconclusive. The veterinarian must be familiar with the dietary needs of cats if he is to diagnose and treat their clinical conditions successfully, and if he is to properly advise his clients on the proper diets for raising healthy, disease-resistant animals.

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Cows' Milk for Lambs.—A newborn lamb needs its mother's colostrum but, if the ewe has no milk, the lamb should be given

up to 2 oz. of cow's milk at three- to four-hour intervals. One-half to one teaspoon of white Karo syrup should be added to each 5 or 6 oz. of milk.—*Sheep Breeder* (April, 1958): 4.

Oxalic Acid Poisoning in Animals

The best known form of oxalate poisoning is Halogeton poisoning of sheep, in western states. In north central and eastern states, cattle, horses, and possibly swine, as well as sheep, may be poisoned on red sorrel (*Rumex oxalis*), actually one of the dock family, and perhaps by common sheep sorrel, one of the same genus of plants.

Animals like the taste of sorrel plants but are seldom poisoned except when they are confined to pens where these plants are plentiful. They are particularly poisonous when cold weather retards growth and they accumulate high levels of soluble oxalates. Sheep are most susceptible, especially lambs, but when horses are poisoned it may take them months to recover. The clinical signs are those of hypocalcemia and, actually, the oxalates "tie-up" calcium in the blood.

Prompt intravenous treatment with calcium solutions is indicated.—A. A. Case in *Sheep Breeder* (May, 1958): 13.

Fat Emulsion for Intravenous Use

A stable nontoxic fat emulsion to be given intravenously for its caloric value has finally been produced. Reactions to previous fat emulsions have been too severe to allow their general use. This product (Lipomul) is made from a highly refined cottonseed oil, 15 Gm.; Phosphatides (purified soya lecithin), 1.2 Gm.; a polymer, 0.3 Gm.; dextrose, 4.0 Gm.; and water, q.s. 100 ml. It is stable for at least one year if stored in a refrigerator.

It has been used in man at the rate of 1,200 to 1,800 cc. per day for 30 or 40 days without untoward reactions. The speed of injection is relatively unimportant but 5 cc. per minute is recommended.

Occasionally, patients complain of headache, backache, anorexia, and pyrexia, but these symptoms are mild and transient. There are practically no contraindications in the absence of a reaction.—*J.A.M.A.* (March 1, 1958): 1042.

Survey of Incomes of Veterinary Practitioners

The 1955-1956 survey of activities of veterinary practitioners (JOURNAL, Aug. 1, 1957*) revealed that approximately one third of those reporting had net incomes over \$12,000 per year. The average for the 850 whose incomes exceeded \$12,000 was \$17,161; for the 1,688 who reported less than \$12,000, it was \$7,490, a difference of \$9,671.

To determine if there were any characteristics of the higher income group that permitted them to obtain this economic advantage, the results of this survey have been further analyzed.

The variables that could be expected to influence net incomes, provided other factors were equal, include the number of years in practice; whether practicing alone or with others; size of the city (or community) in which the veterinarian is located; the number of hours worked per week; and type of practice (predominant species).

YEARS IN PRACTICE

The 1,688 veterinarians in the less than \$12,000 income bracket had practiced an average of ten years compared with 12.3 years for the 850 in the higher bracket—an average of 23 per cent more years of experience for the higher income group.

Grouped by years in practice, an income of over \$12,000 was reported by: 25 per cent with one to nine years of experience; 41 per cent with ten to 14 years; and 47 per cent with 15 to 29 years. After 29 years in practice, only 25 per cent of the few reporting were in the top bracket (table 1).

Years in practice	Income		Total	% Over \$12,000
	Less than \$12,000	More than \$12,000		
1 to 9	971	327	1,298	(25%)
10 to 14	383	268	651	(41%)
15 to 29	259	230	489	(47%)
30 and over	75	25	100	(25%)

Veterinarians in practice more than 14 years comprised 30 per cent of those with incomes of over \$12,000 and only 19.7 per cent of those with smaller incomes.

PARTNERSHIP OR GROUP PRACTICE

Of the practitioners reporting incomes of less than \$12,000, 85 per cent practiced

alone; 12 per cent practiced with one partner or assistant; and 3 per cent with more than one other veterinarian.

Of those reporting incomes over \$12,000, 66 per cent practiced alone; 26.5 per cent were in a two-man practice; and 7.5 per cent practiced with a larger group.

Of the 1,997 veterinarians practicing alone, 28 per cent were in the higher income group; of the 555** practicing with one or more others, 53 per cent reported incomes of \$12,000 or more.

SIZE OF TOWN

The percentage of practitioners in the higher income bracket increased with the size of the city, from 25 per cent in towns of less than 10,000 population to 53 per cent in cities of over 500,000 (table 2).

Size of town	Income		% Over \$12,000
	Less than \$12,000	Over \$12,000	
0-9,999	925 (55%)	302 (35%)	(25%)
10-49,999	422 (25%)	247 (29%)	(37%)
50-499,999	252 (15%)	204 (24%)	(45%)
500,000+	94 (5%)	105 (12%)	(53%)
	1,693 (100%)	859 (100%)	

Of the higher income group, 36 per cent lived in cities larger than 50,000, and 35 per cent were in towns of less than 10,000. Of the lower income group, 20 per cent were in cities larger than 50,000 and 55 per cent in towns of less than 10,000.

HOURS WORKED

There was no significant difference in hours worked between those with more, and those with less, than \$12,000 net income (table 3).

Hours worked	Income less than \$12,000	Income more than \$12,000
20-39	64 (3.8)	25 (3.0)
40-59	393 (23.2)	203 (23.6)
60-79	906 (53.5)	454 (52.8)
80-up	330 (19.5)	177 (20.6)
	1,693 (100%)	859 (100%)

However, there was a marked difference in the income per hour between the high and low income group (table 4, top next page).

*Based on survey conducted by the AVMA Committee on Veterinary Services.

**Difference in totals reporting is due to lack of complete information in a few questionnaires returned.

Hours worked	Average hourly wage (Income less than \$12,000)	Average hourly wage (Income more than \$12,000)
Less than 20	5.88	16.17
20-39	3.84	10.89
40-59	2.80	6.71
60-79	2.09	4.67
80-up	1.62	3.67

Of the 1,693 practitioners earning less than \$12,000, only 33 (1.9%) reported working 20 or less hours per week. Their average hourly wage was \$5.88. All others (98.1%) in the lower income category earned less than \$5.00 per hour. Of the higher income group, 27 per cent earned more than \$5.00 per hour and 17 had an average wage of \$16.17 per hour. Of all practitioners who reported, 88 per cent earned less than \$5.00 per hour.

TYPE OF PRACTICE

Of those who had net incomes in excess of \$12,000, 48.4 per cent derived more than 60 per cent of their gross revenue from pet animal practice, 13.1 per cent derived more than 60 per cent from cattle practice, and 4.4 per cent derived more than 60 per cent from swine practice (table 5).

% of gross income	Income under \$12,000	Income \$12,000 over
Over 60% from dogs and cats	29.5%	48.4%
Over 60% from cattle	29.0%	13.1%
Over 60% from swine	1.2%	4.4%

Thus, of the group with 60 per cent or more of their income from practice with a certain species, 62.1 per cent in dog and cat practice have annual incomes of over \$12,000 compared with 31.1 per cent of those primarily in cattle practice, and 78.6 per cent of those primarily in swine practice. (The latter group comprised 54 practitioners; 2% of the total).

SUMMARY

1) One third of the veterinarians in private practice, who reported, had net incomes of more than \$12,000 per year.

2) The average net income (\$17,161) of this third was more than double that of the other two thirds (\$7,490).

3) Those in the higher income bracket averaged 23 per cent more years of experience than those in the lower bracket.

4) Those practicing with one or more other veterinarians were more frequently in the higher income category.

5) The average income of practitioners

increased with the size of the city in which they practiced.

6) There was no significant difference in the average number of hours worked by those in each bracket. However, those in the higher income group averaged considerably higher earnings per hour, regardless of the number of hours worked.

7) Almost half (48.8%) of those with incomes of over \$12,000 were engaged primarily in dog and cat practice.

EDITORIAL COMMENT

The small number (4%) of veterinarians who reported more than 29 years of practice serve as a reminder that, with the decline of the draft horse, veterinary education was at low ebb in the 1920's. In that decade, an average of 201 were graduated annually, compared with 871 in the 1950's.

The fact that only 25 per cent of the oldest group were in the higher income bracket could mean that many of them were practicing less strenuously than formerly.

The increased average income as the size of the location city increased does not necessarily mean that the big city practitioners have the highest income after deducting living costs. If, as shown, those with a predominant swine practice have the highest percentage in the higher income bracket, that group could be in the most favored position, as to income, because they are usually located in towns of less than 10,000 where living costs are much less than in big cities.

The high average hourly income (\$16.17) of the 17 veterinarians who practice less than 20 hours a week may indicate that they are semiretired and are benefiting from past as well as present endeavors.

Many of these findings are not surprising. However, that the recent survey affords a sound basis for such deductions, as well as for comparisons when future surveys are made, is worth reporting.

One reason for the current optimism of large animal practitioners is the improved livestock market compared with one year ago. In April, beef steer prices ranged from \$27.00 to \$38.50 per hundred (\$20.00 to \$27.50 in April, 1957); milk cows averaged \$200 (\$159 in 1957); market hogs averaged \$21.70 (\$18.33 in 1957); lambs averaged only \$21.75 (\$22.90 in 1957).—*Breeders Gaz.* (May, 1958): 16.

Current Literature

ABSTRACTS

Epizootiology of Chronic Respiratory Disease

Various aspects of the epizootiology of chronic respiratory disease (CRD) have been discussed, emphasis being placed on transmission and control of the disease. The experimental data collected over a period of three years, representing four trials, revealed that transovarian infection was a common mode of perpetuating the disease from one generation to the next. A marked variation in the rate, degree, and even consistency of transmission was observed.

Our knowledge concerning the state of infection during the early growing period of the host is limited. Under certain conditions, CRD-free progeny from infected dams can be maintained for at least 12 months. Antibiotic therapy of infected dams may have reduced but failed to inhibit the elimination of the agent via the egg. Partial flock testing was unreliable in determining the CRD-free status of the flock. Serological testing and removal of reactors may not be effective in eradicating the disease. Once the infection is well established, serological testing is not recommended.

In some commercial flocks, CRD was precipitated after stressing by vaccination for Newcastle disease and infectious bronchitis and, subsequently, spread to most birds in the flock before they reached sexual maturity. Susceptible birds added to these flocks usually contracted the disease within several weeks. The rapid rate of spread of the CRD agent in a flock creates a difficult control problem.—[H. Van Roekel, Olga M. Olesink, and L. P. Beninato: *Symposium on Chronic Respiratory Diseases of Poultry. III. Epizootiology of Chronic Respiratory Diseases in Chickens*. *Am. J. Vet. Res.*, 19, (April, 1958): 453-463.]

Infectious Sinusitis of Turkeys

Infectious sinusitis of turkeys (IS) is discussed, with reference to history, cause, host range, modes of transmission, pathological changes, clinical signs, and differential diagnosis. The methods of control of IS, such as breeding flock selection, serological tests, and antibiotic therapy, also are included.

Of special interest is a control program in Minnesota which was adopted in 1956 and continued in 1957. One hatchery group (11 breeding flocks) was selected from flocks which had no clinical indication of IS over the last two years. The rapid serum-plate test was negative at the beginning and end of the laying season. Clinical IS has not occurred, and retests on the progeny have been negative.

Another group (12 breeding flocks) was selected from flocks which had clinical histories of IS. The infected flocks were given monthly injections of streptomycin and continuously fed a tetracycline in the feed. At the beginning and end of the laying season, 60 per cent of the flocks were positive to the test. Clinical IS has occurred in the progeny

hatched from these flocks this season.—[O. H. Osborn and B. S. Pomeroy: *Symposium on Chronic Respiratory Diseases of Poultry. V. Infectious Sinusitis of Turkeys*. *Am. J. Vet. Res.*, 19, (April, 1958): 468-472.]

Parakeratosis of the Rumens of Lambs

Ruminal parakeratosis is a noncontagious disease characterized, grossly, by hardening, enlargement, and clumping of mucosal papillae and, microscopically, by accumulation of excessive layers of keratinized, nucleated, squamous epithelial cells on the papillae. In each of three experiments, lambs fattened on pelleted feed showed significantly more ruminal parakeratosis at the time of slaughter than lambs fattened on the same feed ingredients in the coarse state.

Lambs which had normal rumens showed a significantly higher rate of gain in body weight than lambs which had ruminal parakeratosis.—[Rue Jensen, J. C. Flint, R. H. Udall, A. W. Deem, and C. L. Seger: *Parakeratosis of the Rumens of Lambs Fattened on Pelleted Feed*. *Am. J. Vet. Res.*, 19, (April, 1958): 277-282.]

BOOKS AND REPORTS

Poultryman's Manual

The author, in the preface to this book, states that it combines veterinary advice with practical pointers on flock management, and that it is written for poultrymen and agricultural advisers and to serve as a textbook for students. In the last six of the eight chapters, he discusses 140 poultry diseases as to cause, signs, diagnosis, prevention, and treatment, including the use of drugs and biological products, together with their dosage and methods of administration. One might well question the advisability of the latter. Unfortunately, it will encourage the owner to become an empiric poultry doctor.—[*Poultryman's Manual (Flock Management and Diseases of Chickens)*. By J. W. Bailey. 296 pages. Springer Publishing Co., Inc., New York, N. Y. 1957. Price \$4.50.]—CHARLES MURRAY.

Textbook for Meat Inspection

This edition of the well-known Ostertag's book on meat inspection has been revised by Goerttler.

The first section discusses, in a general fashion, the fundamental ideas of meat inspection; other chapters are concerned with diseases and defective conditions important for judging meat according to the legal aspects in Germany; local changes of various body parts, internal and parasitic disorders; infectious diseases; and changes of meat during and after slaughtering.

The entire book has been written clearly and contains numerous good illustrations.—[*Textbook for Meat Inspection*. By R. V. Ostertag and V. Goerttler. 27th ed. 320 pages; 108 illustrations. Paul Parey, Berlin, Hamburg, Germany. 1958. Price approx. \$9.00.]—F. KRAL.

THE NEWS

Silver Anniversary AAHA Meeting Held in Chicago, April 23-26

The twenty-fifth anniversary meeting of the American Animal Hospital Association held April 23-26, 1958, at the Drake Hotel, Chicago, proved to be one of its most successful meetings, both in attendance and quality of program material. A registration of 881 broke all previous records.

Among the special events of the meeting were the preconvention workshops, which were practical demonstrations of laboratory procedures, radiology, and other clinical procedures. These workshops attracted 261 veterinarians.

The newly elected officers of the association are: Drs. W. G. Magrane, Mishawaka, Ind., president; W. K. Riddell, Los Angeles, Calif., president-elect; W. H. Riser, Skokie, Ill., vice-president and executive secretary; and R. E. Ruggles, Moline, Ill., treasurer.

The members of the executive board are as follows: Drs. L. R. Barto, Basking Ridge, N. J.—R. P. Knowles, Miami, Fla.—F. R. Booth, Elkhart, Ind.—L. R. Phillips, Lakewood, Colo.—N. L. McBride, Pasadena, Calif.—C. O. Seward, Bremerton, Wash.—J. A. S. Millar, Deal, N. J.



Dr. William G. Magrane, Mishawaka, Ind., President, American Animal Hospital Association.

DR. SCHLOTTHAUER RECEIVES MARK L. MORRIS AWARD

Dr. Carl F. Schlotthauer (STJ '23), professor of experimental surgery at the Mayo Foundation, received the Mark L. Morris small animal medicine award at the AAHA meeting. He was given this award for his unique role of serving as a veterinarian in an advisory capacity for



Retiring AAHA President Joseph A. S. Millar, Deal, N. J., presents plaques honoring four founders of the association. They are (left to right)—Drs. J. V. Lacroix, Evanston, Ill.; S. W. Haigler, St. Louis, Mo.; Mark L. Morris, Topeka, Kan.; and A. R. Theobald, Cincinnati, Ohio.

The presentation was made at the AAHA Silver Anniversary meeting at Chicago, April 25, 1958.



Dr. Carl F. Schlotthauer, winner of the Mark L. Morris award.

35 years at the Mayo Foundation and Mayo Clinic.

Dr. Schlotthauer has contributed 177 scientific papers to veterinary literature and is recognized as an author and lecturer on milk fever and nervous diseases in the dog.

The Morris Foundation was founded by Dr. Mark L. Morris of Topeka, Kan., to sponsor veterinary research at numerous colleges and universities of the country.

Symposium on Recent Developments in Research Methods and Instrumentation

A symposium on the recent developments in research methods and instrumentation was held in conjunction with the eighth annual equipment exhibit from May 12-15, 1958, at the National Institutes of Health, Bethesda, Md.

The products of over 100 manufacturers, displaying the newest research equipment, including surgical, electronic, optical, radiation, and gas-sampling instruments, were shown.

Dr. James A. Shannon, director, National Institutes of Health, opened the symposium. The chairmen of the sessions were: Dr. S. R. Lipsky—gas chromatography; Dr. K. Laki—macromolecules; Dr. R. A. Olson—microrespirometry; Dr. L. Silverman—aerosols; Dr. F. S. Brackett—automatic processing of experimental data; and Dr. H. B. Bull—protein monolayers.

Dr. Mark Allam Chosen "Veterinarian of the Year"

Dr. Mark W. Allam, dean, School of Veterinary Medicine, University of Pennsylvania, was designated as "Veterinarian of the Year"



Dr. Mark W. Allam (right) receives the "Fido" award as "Veterinarian of the Year" from Harry Miller, director of the Gaines Dog Research Center, at the AAHA Convention in Chicago, April 25, 1958.

during the AAHA meeting. Mr. Harry Miller, director, Gaines Dog Research Center, New York, N. Y., sponsor of the award, presented the "Fido" to Dr. Allam.

Veterinary Ophthalmologists Adopt Constitution

The final organizational meeting of the American Society of Veterinary Ophthalmology was held at the Drake Hotel, Chicago, Ill., April 22, 1958. A constitution was adopted.

Officers for the ensuing year are: Drs. W. G. Magrane, Mishawaka, Ind., president; Harlan Jensen, Cleveland, Ohio, vice-president; and Robert Cello, University of California, Davis, Calif., secretary-treasurer. The members of the board of directors are: Drs. Hugh Simpson, Princeton, N. J.—B. Porter, Minneapolis, Minn.—S. R. Roberts, Richmond, Calif. A meeting is planned for Tuesday evening, August 19, in connection with the AVMA Convention in Philadelphia.

Veterinarians interested in membership in the Society are asked to contact Dr. Robert Cello, School of Veterinary Medicine, University of California, Davis, Calif.

Conference for Research Workers and Professors of Veterinary Public Health

The Communicable Disease Center is sponsoring a conference for teachers of veterinary public health and preventive medicine, and for public health workers from June 12 to June 18, 1958, in Atlanta, Ga. Dr. James H. Steele is chairman.

The program is divided into 15 main areas of discussion: principles of epidemiology and epizootiology; the public health veterinarian as an epidemiologist; comparative epidemiology; laboratory diagnostic aids; encephalitis; leptospirosis; food poisonings and infections; rabies; animal tumors; influenza; research grant-in-aid and medical facilities program; respiratory infections; mycotic diseases; parasitology; and undetermined etiology.

Laboratory Refresher Training Courses Offered

The Laboratory Branch of the Communicable Disease Center is offering laboratory refresher training courses from Sept. 15, 1958, to April 10, 1959.

Information and application blanks may be obtained from the Laboratory Branch, Communicable Disease Center, U.S. Public Health Service, P. O. Box 185, Chamblee, Ga.

AMONG THE STATES AND PROVINCES

Florida

Florida Conference for Veterinarians.—The first annual Florida conference for veterinarians was held May 17-18, 1958, at the Health Center Auditorium, University of Florida, Gainesville.

Dr. C. L. Campbell, Jr., Tallahassee, reported on the progress in animal disease eradication programs of the Florida Livestock Board.

Dr. C. D. Van Houweling, Washington, D. C., discussed our responsibility to the livestock industry.

Dr. C. F. Yopp, Jacksonville, reviewed a public relation's program for the Florida State V.M.A.

Dr. W. F. Jackson, Lakeland, moderated a panel discussion on heartworms in dogs in which Drs. R. P. Knowles, Miami, T. H. Maren, University of Florida, and E. F. Thomas, Sarasota, participated.

Dr. J. B. Herrick, Ames, Iowa, presented a discussion on the important sterility problems in the cow.

At the conference's dinner held May 17, President W. W. Armistead spoke on "Your Stake in the AVMA."

Indiana

Michiana Association.—The Michiana V.M.A. conducted a biennial clinic on May 14, 1958, at the Goshen Sales Barn, Goshen.

Dr. George Freier, Benton Harbor, Mich., discussed the difficult dental procedures in the dog, and Drs. C. M. Poole and J. M. Carter, Elkhart, reported on laboratory techniques and diagnostic aids.

Dr. Max Brand, Niles, Mich., reviewed the correction of prolapsed rectums in pigs.

Dr. Harry Magrane, Mishawaka, Ind., presented a discussion on the basic treatments for common ophthalmic lesions.

The association's evening program was held at the Hotel Elkhart, in Elkhart, Ind.

Iowa

Eastern Iowa Association.—The twenty-fourth annual all-day practitioner's clinic was held at Hawkeye Downs, Cedar Rapids, May 6, 1958. Dr. Samuel G. Paul, Clarence, Iowa, acted as chairman.

Registration included 249 veterinarians. An abundance of clinic material was used. Several horses, ponies, cows, lambs, poultry, swine, dogs, and cats were presented for diagnosis, surgery, and treatment.

The chairmen of the five sections were: E. L. Wahl—poultry; T. F. Bartley—swine diagnosis; R. H. Anthony—small animal; S. L. Hendricks—public health; A. B. Evenson—bovine sterility; E. W. Speer—large animal; and O. W. Whitcomb—large animal surgery.

s/F. E. BRUTSMAN, Secretary.

• • •

North Central Association.—The North Central Iowa V.M.A. met April 17, 1958, at the Warden Hotel, Fort Dodge. There were 105 registrations. Nutrition in its relationship to several phases of animal health was the theme of the meeting.

"Stilbestrol—Feeding Versus Implants" was the subject of a paper by Dr. J. Matsushima, University of Nebraska.

Dr. R. C. Klussendorf, director, veterinary medical services, Commercial Solvents Corp., Terre Haute, Ind., discussed stress, nutrition, and antibiotic therapy. The talk was illustrated.

The importance and treatment of lungworm infection was the subject of the talk by Dr. J. C. Trace of Fort Dodge Laboratories.

Treatments for anemia in animals were compared by Dr. M. J. Swenson, head, Department of Veterinary Physiology and Pharmacology, Iowa State College, Ames.

The officers who will serve the association for the ensuing year are: Drs. John Morton, Webster City, president; J. R. Rosdail, Pomeroy, president-elect; and H. J. Engelbrecht, Fort Dodge, secretary-treasurer.

s/H. ENGELBRECHT, Secretary-Treasurer.

Maine

Maine Association.—The spring meeting of the Maine V.M.A. was held April 9, 1958, at the Penobscot Valley Country Club.

Dr. T. Y. Tanabe (Ph.D.) from the Department of Dairy Science, Pennsylvania State University, reported on the "New Advances in Understanding Bovine Breeding Problems" and Dr. Russell N. Abbott, Rockland, illustrated with slides, a "Demonstration of Leighton's Intramedullary Shuttle Pins."

At the business meeting, the reports of the committees were presented; also state and federal reports.

The following roster of officers were elected at the association's January meeting: Drs. Philip Brown, Belfast, president; John Woodcock, Pittsfield, vice-president; Frank Witter, Orono, secretary-treasurer. Dr. A. E. Coombs, Skowhegan, was elected delegate and Dr. F. Langdon, Davis, Augusta, alternate, to the AVMA House of Delegates in Philadelphia.

s/FRANK WITTER, *Secretary*.

Women's Auxiliary.—The Women's Auxiliary to the Maine V.M.A. met in conjunction with the meeting of the State Association on April 9, 1958, at the Orono Country Club.

At the January meeting of the association, the following officers were elected: Mrs. Theresa Monahan, Brunswick, president; Mrs. Anne Heldenbrand, Portland, president-elect; Mrs. Jean Hersey, Rumford Center, vice-president; Mrs. Hazel Libby, Richmond, secretary; and Mrs. Verna Witter, Orono, treasurer.

Maryland

Eastern Shore Association.—At the last meeting of the Eastern Shore V.M.A. held at Cambridge, Md., April 17, 1958, the following officers were elected: Drs. A. J. Blaney, Centerville, president; E. B. Daugherty, Delmar, Del., vice-president; I. M. Moulthrop, Salisbury, secretary.

Mr. V. H. Diver, Woolford, a retired advertising executive discussed "Public Relations."

s/I. M. MOULTHROP, *Secretary*.

Missouri

Women's Auxiliary.—The Women's Auxiliary to the Greater St. Louis V.M.A. held its regular monthly meeting at the Coronado Hotel in St. Louis on April 4, 1958.

The Auxiliary elected the following members to the nominating committee: Mrs. Leroy Atkinson, chairman; Mrs. Anthony R. Bott, Mrs. James H. Evans, Mrs. Wesley Wertz, ex-officio. The election of officers will take place at the Auxiliary's May meeting.

The program for the evening consisted of an auction held among the members for the benefit of the AVMA Research Fund and the National Student Loan Fund.

Nevada

Western Nevada Veterinary Society Formed.—Twenty-two veterinarians in western Nevada cities, including Reno, Fallon, Minden, Sparks, and Yerington, recently formed the Western Nevada Veterinary Society. Its purpose is to advance relationships among its member veterinarians and with the public.

The first meeting was held on March 7, 1958, and monthly dinner meetings will be

held on the first Tuesday of each month, with each member serving as chairman for one meeting in alphabetical order. Dr. Paul S. Sylva, Reno, was elected secretary.

s/PAUL S. SYLVA, *Secretary*.

Ohio

Dr. Knudson Is Honored at Ohio State University.—At the professional interfraternity council's annual recognition banquet at Ohio State University, Dr. Robert L. Knudson (OSU '34) was awarded a plaque for his contributions in the field of veterinary medicine.



Dr. Robert L. Knudson

This award is given to alumni of the university's various professional fraternities who are considered to be outstanding in their profession.

Since graduation, Dr. Knudson has been engaged in animal disease control with the U.S.D.A. and, for the past ten years, he has been veterinarian in charge of animal disease control in Ohio for the Agricultural Research Service.

Dr. Knudson is a member of Alpha Psi and Phi Zeta. He is also secretary of the Ohio State V.M.A.

Pennsylvania

Keystone Association.—The regular meeting of the Keystone V.M.A. was held on April 23, 1958, at the School of Veterinary Medicine, University of Pennsylvania, in Philadelphia.

Dr. Robert S. Brodey presented an illustrated talk on "Surgical Skin Diseases."

s/R. C. SNYDER, *Secretary*.

Texas

Retired Veterinarian Turns Painter.—Dr. Horst (Heiri) Schreck, 73, Ysleta, Texas, a retired veterinarian, spends most of his time

painting. He formerly operated a large veterinary practice in the El Paso Valley.

Last August, Dr. Schreck completed an 8 by



—The Rotarian

Dr. Horst Schreck (a self-portrait)

12 ft. mural for "the people of El Paso Valley," which hangs in the Citizen's State Bank in Ysleta.

U. S. GOVERNMENT

Veterinarians Sought by U.S. Civil Service Commission.—The U.S. Civil Service Commission recently announced examinations for filling positions for veterinarians in the Department of Agriculture and other federal agencies in Washington and throughout the U.S. Basic entrance salaries range from \$5,335 to \$10,320 a year.

To qualify, applicants must have appropriate education plus professional experience. Positions are available in the grades GS-7 to GS-14.

Applications will be accepted by the Board of U.S. Civil Service Examiners, 6th floor, Administration Building, U.S. Department of Agriculture, Washington 25, D.C., until further notice.

STATE BOARD EXAMINATIONS

Interested persons can obtain information about applications, fees, deadlines for filing applications, and exact time and place of examinations of the respective boards by writing to the persons whose names and addresses are given below.

BRITISH COLUMBIA—June and November, 1958 (usually end of the second week); Vancouver. G. L. Stovell, British Columbia Veterinary Association, 3187 West 43rd Ave., Vancouver 13, secretary.

DISTRICT OF COLUMBIA—June 26, 1958, Department of Occupations and Professions, 1740 Massachusetts Ave., N.W., Washington, D.C. A. F. McEwan, secretary, 1740 Massachusetts Ave., N.W., Washington 6, D.C.

FLORIDA—June 16-17-18, 1958, Biscayne Terrace Hotel, Miami. Dr. E. L. Matthews, secretary, Box 141, Palatka, Fla.

INDIANA—July 8-9, 1958, House of Representatives, State House, Indianapolis, Ind. Joe W. Green, secretary, Room 413, 611 N. Park Ave., Indianapolis 4, Ind.

IOWA—June 16-17, 1958, Office of the Division of Animal Industry, State House, Des Moines, Iowa. A. L. Sundberg, chief, Division of Animal Industry, Des Moines, Iowa.

KENTUCKY—July 28, 1958, University of Kentucky, Lexington. J. K. Bushnell, secretary, 229 Houston, Paris, Ky.

MAINE—July 7-8, 1958, State House, Augusta, Maine. E. C. Moore, secretary, Turner Center, Maine.

MARYLAND—June 18, 1958, written examination; June 19, 1958, practical examination; College Park, Md. Harold S. Gohber, secretary, 5400 Park Heights Ave., Baltimore 15, Md.

MASSACHUSETTS—June 26-27-28, 1958, Amherst. Dr. Edward A. Blake, secretary, Room 33, State House, Boston, Mass.

MISSISSIPPI—June 17, 1958, Jackson, Miss. Wm. L. Gates, secretary, Box 417, Clarksdale, Miss.

MONTANA—June 30-July 2, 1958, Montana State College, Bozeman. J. W. Safford, secretary treasurer, Capitol Station, Helena, Mont.

NEW HAMPSHIRE—July 1, 1958, State House, Concord, N.H. J. P. Sernichick, secretary-treasurer.

NEW YORK—June 18, 19, 1958, practical examination, Ithaca; June 24-27, 1958, written examination, New York City, Albany, Syracuse, Buffalo, and Rochester. John W. Paige, chief, Bureau of Examinations and Registrations, 23 S. Pearl St., Albany, N.Y.

NORTH CAROLINA—June 23-25, 1958, Hotel Washington Duke, Durham, N. Car. James I. Cornwell, secretary, 65 Beverly Road, Beverly Hills, Asheville, N. Car.

RHODE ISLAND—July 8-9, 1958, 505 Veterans' Memorial Bldg., Providence, R.I. T. J. Grennan, Jr., secretary, Box 31, Allenton, R. I.

SASKATCHEWAN—June 17, 1958, University of Saskatchewan, Saskatoon, Sask. Fred M. Clark, secretary, 619 9th Ave., Saskatoon, Sask.

SOUTH CAROLINA—June 19-20, 1958 (tentative), Columbia. H. L. Sutherland, secretary, P. O. Box 87, Union, S. Car.

SOUTH DAKOTA—June 23-24, 1958, Veterinary South Dakota State College, Science Department, Brookings. Dr. M. D. Mitchell, secretary, Livestock Sanitary Board, Pierre, S. Dak.

TENNESSEE—June 23-24, 1958, Nashville, Tenn. W. O. Greene, secretary, 4119 Hillsboro Road, Nashville, Tenn.

UTAH—June 19-20, 1958, State Capitol Building, Salt Lake City, Utah. Obtain Application from Mr. Frank Lees, State Capitol Bldg., Salt Lake City. Dr. Wayne Binns, Chairman, Utah State Veterinary Board of Examiners, Utah State University, Logan, Utah.

VIRGINIA—June 26, 1958, Capitol Building, Richmond, Va. T. N. Burton, secretary, Department of Professional and Occupational Registration, P. O. Box 1-X, Richmond, Va.

WISCONSIN—June 23-24, 1958, Madison. A. A. Erdmann, State Capitol, Madison 2, Wis.

DEATHS

Star indicates member of AVMA

J. W. Baer (KCV '12), 78, Malvern, Iowa, died Jan. 8, 1958. Dr. Baer had practiced for 45 years prior to his retirement, and was active in

community affairs. His survivors include his widow, a son, and a daughter.

Rufus M. Bailey (TH '18), 60, Goldsboro, N. Car., died March 29, 1958, at Wayne Memorial Hospital.

Dr. Bailey had practiced in Goldsboro for more than 23 years. He is survived by his widow, Mrs. Edna Braswell Bailey, one daughter, and four brothers.

★**Charles F. W. Bauer** (ONT '03), 82, Florissant, Mo., died March 25, 1958. Dr. Bauer, a general practitioner, was a member of the Missouri and St. Louis District V.M.A.'s and of the AVMA. He is survived by his widow.

★**A. Henry Craige, Jr.** (UP '32), 48, chief veterinarian of Pitman-Moore Company, died on April 11, 1958, after an illness of several months.

A native of Philadelphia, where he was born in 1909, Dr. Craige attended West Philadelphia High School before enrolling at the University of Pennsylvania Veterinary School. Following graduation, he was a member of the faculty and research staff there until 1941, when he joined Pitman-Moore as a veterinary pharmacologist, working in research and promotion.

He left the company in 1945 to enter private practice in Pennsylvania and two years later became professor of veterinary physiology at the University of Maryland. In 1951, Dr. Craige returned to Pitman-Moore as chief veterinarian and played major roles in the development of a number of products. He also served as a consultant to the Bureau of Narcotics, U.S. Treasury Department, in the development of a test method for "doping" in race horses which is now generally used.

For several years, Dr. Craige was a lay-leader in the Episcopal Church; he had been preparing to become a deacon and would have been examined for the ministry last February had it not been for his illness.

Surviving are his widow, Mrs. Elizabeth Craige, whom he married in 1934, and two children; also his father, two sisters, and a brother, John E. Craige, V.M.D., of California.

Harry C. Ingraham (KCV '14), 72, Kansas City, Kan., died in March, 1958. Prior to his retirement some time ago, Dr. Ingraham had served with the ARS, U. S. Department of Agriculture.

★**Thomas W. Munce** (UP '15), 66, Sioux City, Iowa, former director of Pitman-Moore Company's biological laboratories and retired official of the firm's parent company, Allied Laboratories, Inc., died on April 21, 1958, following a heart attack on the previous day.

Dr. Munce was born at Washington, Pa., in

1891, and was a graduate of W. & J. Academy and attended its college before enrolling at the University of Pennsylvania veterinary school from which he received his V.M.D. in 1915. Following graduation, he practiced in Ohio for a year, then was on the staff of the state veterinarian of New Jersey before being commissioned in the Army Veterinary Corps in World War I, in which he served from December, 1917, to January, 1919, with duty at Fort Jay, N. Y.

Dr. Munce joined Pitman-Moore in February, 1919, engaging in production and research at the Zionsville, Ind., laboratories, later became president of the Sioux City division, vice-president of Allied Laboratories, and a member of its board of directors. He retired in March, 1957. He was a recognized authority on swine diseases and their control and author of many published papers on the subject.

Dr. Munce was a member of the AVMA (joined 1915) and of the Iowa and Pennsylvania associations. He was a charter member of the Zionsville, Ind., Lions Club, a past-master of its Masonic Lodge, and belonged to the Sioux City Shrine, and the Presbyterian Church there.

Surviving are his widow, Mrs. Elizabeth Hopkins Munce, whom he married in 1928, and a sister.

★**George W. Pedigo** (CVC '10), 71, Glasgow, Ky., died March 26, 1958. Dr. Pedigo was active in civic and professional activities, having served as president of the Kentucky V.M.A., on the State Board of Veterinary Examiners, the city school board, and as captain with the Kentucky guard. He is survived by his widow, a son, and a daughter. Dr. Pedigo was admitted to the AVMA in 1916.

★**Doyce D. Smith** (OKL '51), 32, Cherokee, Okla., died March 30, 1958, following abdominal surgery. Dr. Smith, a general practitioner, was a member of the Oklahoma V.M.A. and of the AVMA.

Cecil H. Stevens (UP '11), 82, Wyalusing, Pa., died March 26, 1958. Dr. Stevens had served as state veterinarian in Montana for 39 years. He had lived in Wyalusing since his retirement in 1949.

Harvey N. Umbstaetter (UP '17), 66, Amherst, Ohio, died March 17, 1958. Dr. Umbstaetter had practiced in Amherst since 1929. He was a member of the Ohio and Lorain County V.M.A.'s. His widow survives.

Joseph S. Wolfram (MCK '18), 62, East St. Louis, Ill., died March 20, 1958. Dr. Wolfram had served with the Department of Agriculture in East St. Louis. He is survived by his widow and a daughter.

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A scene at Philadelphia's Zoo, an animal wonderland.

Reminders About the Philadelphia Convention

August 18-21, 1958

Hotel Reservations

Rate information on Philadelphia hotels and a reservation form will be found on adv. page 50, facing a location map on adv. page 51.

Shuttle Bus Service

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in New York City were mailed last month to all AVMA members; arrangements for these trips are being made by the Happiness Travel Service of Chicago.

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COMING MEETINGS

Georgia-South Carolina Veterinary Medical Association. Joint Meeting, Bon Air Hotel, Augusta, Ga., June 19-21 1958. A.M. Mills, 325 Pinecrest Drive, Athens, Ga., secretary, program committee.

Idaho and Wyoming Veterinary Medical Association. Joint meeting. Wort Hotel, Jackson Hole, Wyo., June 21-23, 1958. A. P. Schneider, 3025 N. 23rd St., Boise, Idaho, IVMA secretary; J. F. Ryff, P.O. Box 960, Laramie, Wyo., WVMA secretary.

California Veterinary Medical Association. Seventieth annual meeting. Hotel St. Claire, San Jose, June 23-25, 1958. C. H. Ozanian, 10326 Artesia Blvd., Bellflower, program chairman; Chas. S. Travers, 3004 16th St., San Francisco, executive secretary.

Maritime Veterinary Associations. Joint conference. Mount Allison University, Sackville, N.B., June 24-26, 1958. Dr. J. F. Frank, Box 310, Sackville, N.B., chairman.

North Carolina State Veterinary Medical Association. Fifty-seventh annual meeting. The Washington Duke Hotel, Durham, June 24-26, 1958. C. J. Lange, 3741 Hi-Point Rd., Greensboro, secretary-treasurer.

Utah Veterinary Medical Association. Annual meeting. Ogden, June 25-26, 1958. J. A. Thomas, P.O. Box 592, Provo, secretary.

Nebraska State Veterinary Medical Association. Summer meeting. Kearney, Neb., July 18-20, 1958. W. T. Spencer, 1250 N. 37th, Lincoln, secretary.

Alabama Polytechnic Institute. Annual conference for veterinarians. School of Veterinary Medicine, Auburn, July 20-23, 1958. T. C. Fitzgerald, program chairman.

Kentucky Veterinary Medical Association. Forty-seventh annual convention. Seelbach Hotel, Louisville, July 21-

22, 1958. R. H. Singer, 136 Shawnee Place, Lexington, secretary-treasurer.

Canadian Veterinary Medical Association. Tenth annual Convention. Royal Alexandra Hotel, Winnipeg, Manitoba, July 21-23, 1958. Claude Kesley, 1195 Wellington St., Ottawa 3, Ont., executive secretary.

Mississippi State Veterinary Medical Association. Fifty-second annual meeting. Buena Vista Hotel, Biloxi, Aug. 10-12, 1958. H. F. McCrory, State College, Miss., secretary.

American Association of Veterinary Bacteriologists. Annual meeting. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Aug. 16, 1958. C. H. Cunningham, Michigan State University, College of Veterinary Medicine, East Lansing, secretary.

American Veterinary Medical Association. Ninety-Fifth Annual Meeting. Convention Hall, Philadelphia, Pa., Aug. 18-21, 1958. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

New York State Veterinary Medical Society. Sixty-seventh annual meeting. Concord Hotel, Kiamasha Lake, N. Y., Sept. 4-6, 1958. Miss Joan S. Halat, 803 Varick St., Utica, N. Y., executive secretary.

Washington State Veterinary Medical Association. Annual meeting. Hotel Olympian, Olympia, Sept. 8-10, 1958. F. M. Shigley, P.O. Box 1163, Olympia, Wash., program chairman.

South Dakota Veterinary Association. Meeting. Hotel Cateract, Sioux Falls, Sept. 16-17, 1958. G. E. Duncan, Tyndall, secretary.

New England Veterinary Medical Association. Annual meeting. Hotel Wentworth, Portsmouth, N. H., Sept. 28-Oct.

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1, 1958. C. Lawrence Blakely, 100 Longwood Ave., Boston 15, Mass., secretary-treasurer.

District of Columbia Veterinary Medical Association. Annual all-day meeting. Walter Reed Army Medical Center, Washington, D.C., Oct. 14, 1958. W. I. Gay, 5200 Chandler St., Bethesda, Md., secretary-treasurer.

Eastern Iowa Veterinary Association, Inc. Annual meeting. Hotel Roosevelt, Cedar Rapids, Oct. 16-17, 1958. F. E. Brutsman, Traer, Iowa, secretary-treasurer.

Texas Veterinary Medical Association. Annual meeting. Stephen F. Austin Hotel, Austin, Oct. 19-21, 1958. Paul B. Blunt, 710 Maverick Bldg., San Antonio, secretary.

Florida State Veterinary Medical Association. Annual meeting. Galt Ocean Mile Hotel, Fort Lauderdale, Oct. 26-28, 1958. A. R. Chambers, 6116 Main St., Jacksonville, secretary.

Southern Veterinary Medical Association. Annual meeting. Claridge Hotel, Memphis, Tenn., Oct. 26-30, 1958. A. A. Husman, P.O. Box 91, Raleigh, N. Car., secretary.

Arizona Veterinary Medical Association. Annual meeting. Yuma, Ariz., Dec. 7-9, 1958. R. E. McComb, Jr., 4730 N. 7th Ave., Phoenix, program chairman.

Tennessee Veterinary Medical Association. Annual meeting. Noel Hotel, Nashville, Jan. 11-13, 1959. H. W. Hayes, 5009 Clinton Pike, Knoxville, secretary-treasurer.

Oklahoma Veterinary Medical Association. Annual meeting. Mayo Hotel, Tulsa, Jan. 25-27, 1959. M. N. Riemen-schneider, 122 State Capitol Bldg., Oklahoma City, secretary.

Foreign Meetings

Sixth International Congresses on Tropical Medicine and Malaria. Lisbon, Portugal, Sept. 3-13, 1958. Professor

Manuel R. Pinto, Institute of Tropical Medicine, Lisbon, secretary-general. (Membership application forms may be obtained by U.S. veterinarians by writing to the AVMA.)

German Veterinary Association. Regular biennial meeting. Hannover, Germany, Sept. 19-21, 1958. Dr. Karl Ohly, 123 Forsthausstrasse, Frankfurt/Main, Germany, president.

International Veterinary Congress. Sixteenth session. Madrid, Spain, May 21-27, 1959. Prof. Pedro Carda A., general secretary, Calle Villanueva 11, Madrid.

U.S. COMMITTEE: Dr. W. A. Hagan, chairman, New York State Veterinary College, Ithaca, N. Y.; Dr. J. G. Hardenbergh, secretary, 600 S. Michigan Ave., Chicago 5, Ill.

Third World Congress on Fertility and Sterility. Amsterdam, Holland, June 7-13, 1959. Dr. L. I. Swaab, Sint Agnietenstraat 4, Amsterdam, Holland, honorary secretary.

Regularly Scheduled Meetings

ALABAMA—Central Alabama Veterinary Association, the first Thursday of each month. Dr. G. W. Jones, Main St., Prattville, Ala., secretary-treasurer.

Jefferson County Veterinary Medical Association, the second Thursday of each month. S. A. Price, 213 N. 15th St., Birmingham, secretary.

Mobile-Baldwin Veterinary Medical Association, the third Tuesday of each month. W. David Gross, 771 Holcombe Ave., Mobile, Ala., secretary.

North Alabama Veterinary Medical Association, the second Thursday of November, January, March, May, July,

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and September, in Decatur, Ala. Ray A. Ashwander, Decatur, Ala., secretary.

North East Alabama Veterinary Medical Association, the second Tuesday of every other month. Leonard J. Hill, P.O. Box 761, Gadsden, Ala., secretary-treasurer.

ARIZONA—Central Arizona Veterinary Medical Association, the second Tuesday of each month. Keith T. Maddy, Phoenix, Ariz., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. E. T. Anderson, Rt. 2 Box 697, Tucson, Ariz., secretary.

CALIFORNIA—Alameda-Contra Costa Veterinary Medical Association, the fourth Wednesday of Jan., March, May, June, Aug., Oct., and Nov. Leo Goldston, 3793 Broadway, Oakland 11, Calif., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of February, April, July, September, and December. Herb Warren, 3004 16 St., San Francisco, Calif., executive secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. R. B. Barsaleau, 2333 E. Mineral King, Visalia, Calif., secretary.

Kern County Veterinary Medical Association, the first Thursday evening of each month. James L. Frederickson, 17 Niles St., Bakersfield, Calif., secretary-treasurer.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. W. H. Rockey, P.O. Box 121, San Luis Obispo, Calif., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 90 Corral de Tierra, Salinas, Calif., secretary.

North San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month at the Hotel Covell, in Modesto, Calif. Lyle A. Baker, Turlock, Calif., secretary.

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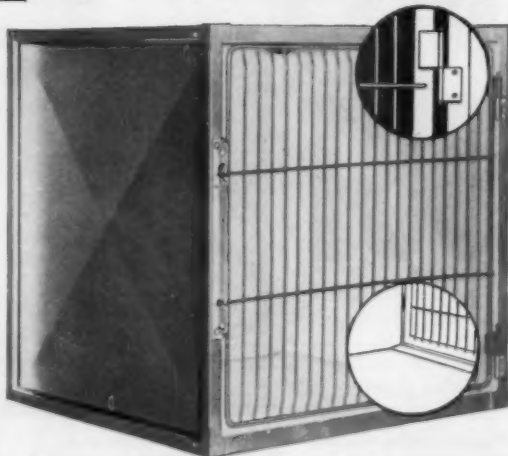
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Orange Belt Veterinary Medical Association, the second Monday of each month. Chester A. Maeda, 766 E. Highland Ave., San Bernardino, Calif., secretary.

Orange County Veterinary Medical Association, the third Thursday of each month. Donald E. Lind, 2643-N. Main St., Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. R. M. Granfield, 2600 W. El Camino Real, San Mateo, Calif., secretary-treasurer.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. Robert L. Chandler, P.O. Box 8, Ukiah, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. W. E. Steiomecz, 4227 Freepoint Blvd., Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. H. R. Rossoll, 1795 Moore St., San Diego, Calif., secretary.

San Fernando Valley Chapter SCVMA, the second Tuesday of each month at 7:30 p.m., Hody's Restaurant, North Hollywood, Calif. Dr. V. H. Austin, 14931 Oxnard St., Van Nuys, secretary-treasurer.

San Fernando Valley Veterinary Medical Association, the second Friday of each month at the Casa Escobar Restaurant in Studio City. Dr. Rolf Reese, 23815 Ventura Blvd., Calabasas, Calif., secretary.

Santa Clara Valley Veterinary Association, the fourth Tuesday of each month. Kay Beulley, N. Fourth and Gish Rd., San Jose, Calif., secretary.

Southern California Veterinary Medical Association, the last Wednesday of each month. Don Mahan, 1919 Wilshire Blvd., Los Angeles 57, Calif., executive secretary.

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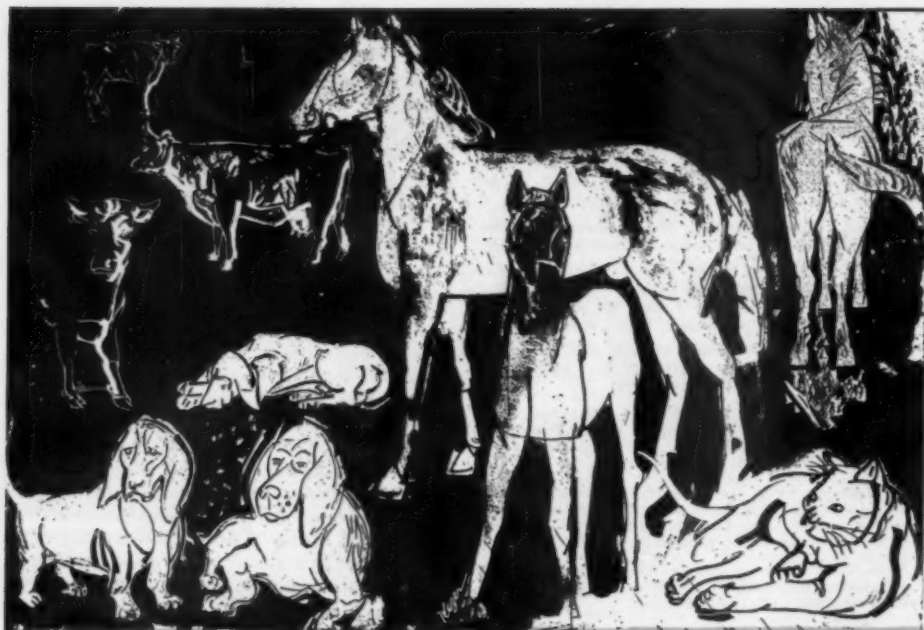
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Figure 1

History.—A male Boxer, 5 years old, was in good health but occasionally vomited. He was prepared for barium studies of the gastrointestinal tract by withholding food and water for 12 hours. He was then given 3 oz. of a thin barium solution *per os*, and several lateral recumbent radiographs were taken at specified intervals as the solution progressed through the bowel. This radiograph was taken two hours after the solution was given.

Here Is the Diagnosis

(Continued from preceding page)

Diagnosis.—Cestodiasis (identified later as *Dipylidium caninum*) of the small intestine in a dog.

Comment.—Cestodes and nematodes apparently adsorb enough barium to make them radiopaque. If a small amount of a thin solution is given, the parasites (fig. 1, lower left) are easily demonstrated. If a large volume of solution is given, the entire bowel is filled (fig. 1, lower right) and the parasites can not be distinguished.

This case was submitted by Dr. W. H. Crago, Youngstown, Ohio.

Our readers are invited to submit histories, radiographs, and diagnoses of interesting cases which are suitable for publication.

Smoking and Death Rates

In an exhaustive study on 187,783 white men over 50 years of age, from 1952 to 1955 (667,753 man years), the death rate in regular cigarette smokers was 68 per cent higher than in non-smokers. For those who smoked two or more packs of cigarettes a day, it was 123 per cent higher. For those who regularly smoked cigars only, the death rate was 22 per cent higher; and for pipe smokers, 12 per cent higher, than for nonsmokers.—*J. Am. M. A.* (March 8, 1958): 1159.

• • •

With cigarette smoking, there was an extremely high association for cancer of the lung, larynx, and esophagus (and gastric ulcers); a high association for pneumonia, duodenal ulcer, aortic aneurysm, coronary artery disease, cirrhosis of the liver, and cancer of several sites; and little or no association for hypertensive heart disease, rheumatic fever, and cancer of the colon and brain.

The death rate was lower in men who had given up cigarette smoking a year before the study started than in those who continued to smoke.—*J. Am. M. A.* (March 15, 1958): 1294.

Eliminating Lampreys.—Six chemicals have been discovered which, in small doses, will kill lampreys without harming game fish. The sea lamprey invasion of the Great Lakes has greatly reduced

the once heavy game fish catch. The lamprey is a predator which attaches itself to the fish by its sucker-like mouth and rasps away the flesh with a circle of razor-sharp teeth.—*Sci. News Letter* (March 1, 1958): 133.

An Essay on Cats

A school boy wrote: "Cat's that's meant for little boys to maul and tease is called Maultease cats. Some cats is rekernized by how their pur is and these is Pursian cats. Cats what has bad tempers is named Angora cats. And cats with deep feelings is called Felines."—*U. S. Fur Rancher* (Feb., 1958): 36.

Reaction of a Parrot to Anesthesia

A parrot with a broken leg was difficult to handle so it was anesthetized with chloroform. A few minutes after the cast was in place the parrot recovered, then sat up and swore. The cast was removed in ten days (without anesthesia). The leg had healed satisfactorily.—*Vet. Rec.* (April 5, 1958): 306.

Dairy bulls in the United States are estimated to kill one person every four days.—*A. I. Digest* (Feb., 1958): 5.

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ond Thursday of each month. D. E. Britten, 544 N. Ben Maddox, Visalia, Calif., secretary.

COLORADO—Denver Area Veterinary Society, the fourth Tuesday of every month. Richard C. Tolley, 5060 S. Broadway St., Englewood, Colo., secretary.

Northern Colorado Veterinary Medical Society, the first Monday of each month. M. A. Hammarlund, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., secretary.

DELAWARE—New Castle County Veterinary Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. E. J. Hathaway, Clifton Park Manor, Apt. 73-5, Wilmington 2, Del., secretary.

FLORIDA—Central Florida Veterinary Medical Association, the first Tuesday of each month, time and place specified monthly. Jack H. McElyer, 5925 Edgewater Drive, Orlando, Fla., secretary.

Florida West Coast Veterinary Medical Association, the second Wednesday of each month at the Lighthouse Inn, St. Petersburg. William F. Casler, 2540 30th Ave., N., St. Petersburg, secretary-treasurer.

Jacksonville Veterinary Medical Association, the first Thursday of every month. Dodsons Restaurant, P. S. Roy, 4443 Atlantic Blvd., Jacksonville, Fla., secretary.

Northwest Florida Veterinary Medical Society, third Wednesday of each month, time and place specified monthly. T. R. Geci, 108B Catherine Ave., Pensacola, Fla., secretary.

Palm Beach Veterinary Society, the last Thursday of each month in the county office building at 810 Datura St., West Palm Beach. J. J. McCarthy, 500-23th Street, West Palm Beach, Fla., secretary.

Ridge Veterinary Medical Association, the fourth Thursday of each month in Barrow, Fla. Paul J. Myers, Winter Haven, Fla., secretary.

South Florida Veterinary Society, the third Wednesday of each month. Time and place specified monthly. Frank Mueller, Jr., 4148 E. 8th Ave., Hialeah, Fla., secretary.

Suwannee Valley Veterinary Association, the fourth Tuesday of each month. Hotel Thomas, Gainesville. W. B. Martin, Jr., 3082 N. W. 6th St., Gainesville, Fla., secretary.

Volusia County Veterinary Medical Association, the fourth Thursday of each month. A. E. Hixon, 131 Mary St., Daytona Beach, Fla., secretary.

Racing Chemistry Research Fund Organized

Trustees of the Racing Chemistry Research Fund, Inc., met early in February at the office of the National Association of State Racing Commissioners in Lexington, Ky., to organize for the collection of funds which will be used for additional research in "racing chemistry"; that is, presumably, for improved methods of detecting substances and the amounts of substances that may affect, or may be used to affect, the performance of race horses.

James H. Inglis, of Michigan, was named chairman of the board; Dwight D. Murphy, of California, vice chairman, and Mrs. A. E. Smith, NASRC secretary, was named secretary-treasurer. Research projects financed by the Fund will be assigned to various universities.—*The Blood Horse*, Feb. 8, 1958, p. 372.

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GEORGIA—Atlanta Veterinary Society, the third Thursday of each month at the Elk's Home, 726 Peachtree St., Atlanta. Donald C. Ford, Forest Park, secretary.

ILLINOIS—Chicago Veterinary Medical Association, the second Tuesday of each month. Charles H. Armstrong, 1021 Davis St., Evanston, secretary.

Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December. A one-day clinic is held in May. Alfred G. Schiller, Veterinary Clinic, University of Illinois, Urbana, secretary-treasurer.

INDIANA—Central Indiana Veterinary Medical Association, the second Wednesday of each month. Peter Johnson, Jr., 4410 N. Keystone Ave., Indianapolis 5, secretary.

Michiana Veterinary Medical Association, the second Thursday of every month except July and December, at the Hotel LaSalle, South Bend, Ind. J. M. Carter, 3421 S. Main St., Elkhart, Ind., secretary.

Tenb District Veterinary Medical Association, the third Thursday of each month. J. S. Baker, P. O. Box 52, Pendleton, Ind., secretary.

IOWA—Cedar Valley Veterinary Medical Association, the second Monday of each month, except January, July, August, and October in Black's Tea Room, Waterloo, Iowa. A. J. Cotten, Grundy Center, secretary.

Central Iowa Veterinary Medical Association, the third

Monday of each month, except June, July, and August, at 6:30 p.m., Breese House, Ankeny, Iowa. John Herrick, Ames, secretary.

Coon Valley Veterinary Medical Association, the second Wednesday of each month, September through May, at 7:30 p.m., Cobblestone Inn, Storm Lake, Iowa. Robert McCutcheon, Holstein, secretary.

East Central Iowa Association, the second Thursday of each month at 6:50 p.m., usually in Cedar Rapids, Iowa. Dr. J. G. Irwin, Iowa City, secretary.

Fayette County Veterinary Medical Association, the third Thursday of each month at 6:30 p.m. in West Union, Iowa. H. J. Morgan, West Union, secretary.

Lakes Veterinary Association, the first Tuesday of each month, September through May, at 6:30 p.m., at the Gardson Hotel, Estherville, Iowa. Barry Barnes, Milford, secretary.

North Central Iowa Veterinary Medical Association, the third Thursday of April, at the Warden Hotel, Fort Dodge, Iowa. H. Engelbrecht, P. O. Box 797, Fort Dodge, secretary.

Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Wisnietick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northwest Iowa Veterinary Medical Association, the second Tuesday of February, May, September, and December, at the Community Bldg., Sheldon. W. Ver Meer, Hull, secretary.

Southeastern Iowa Veterinary Association, the first Tuesday of each month at Mt. Pleasant, Iowa. Warren Kilpatrick, Mediapolis, secretary.

Southwestern Iowa Veterinary Medical Association, the first Tuesday of April and October, Hotel Chieftain, Council Bluffs, Iowa. J. P. Stream, Creston, secretary.

Upper Iowa Veterinary Medical Association, the third Tuesday of each month at 7:00 p.m., at All Vets Center, Clear Lake, Iowa. Richard Baum, Osage, secretary.

KENTUCKY—Central Kentucky Veterinary Medical Association, the first Wednesday of each month. L. S. Shurrell, Versailles Rd., Frankfort, secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month in Louisville or within a radius of 50 miles. W. E. Bewley, P.O. Box "H," Crestwood, secretary.

MARYLAND—Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m., at the Park Plaza Hotel, Charles and Madison St., Baltimore, Md. Norman Herbert, 3546 Joann Drive, Baltimore 7, Md., secretary.

MICHIGAN—Mid-State Veterinary Medical Association, the fourth Thursday of each month with the exception of November and December. Robert E. Kader, 5034 Armstrong Rd., Lansing 17, Mich., secretary.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. S. Correll, Rt. 1, Midland, Mich., secretary.

Southeastern Veterinary Medical Association, the fourth Wednesday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Rd., Detroit 5, Mich., secretary.

MISSOURI—Greater St. Louis Veterinary Medical Association, the first Friday of each month (except July and August), at the Coronado Hotel, Lindell Blvd. and Spring Ave., St. Louis, Mo., at 8 p.m. Chester R. Plenge, 4249 Peck St., St. Louis 7, Mo., secretary.

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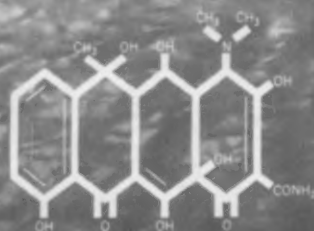
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NEVADA—Western Nevada Veterinary Society, the first Tuesday of each month. Paul S. Silva, 1170 Airport Road, Reno, Nev., secretary.

NEW JERSEY—Central New Jersey Veterinary Medical Association, the second Thursday of November, January, March, and May at Old Hights Inn, Hightstown, N. J. David C. Tudor, Cranbury, N. J., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from October through April at the Academy of Medicine, 91 Lincoln Park South, Newark, N. J. Myron S. Arlein, 2172 Milburn Ave., Maplewood, N. J., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday of each month at the Elks Club, Hackensack. Burritt Lupton, 569 Franklin Ave., Wyckoff, secretary.

Northwest Jersey Veterinary Society, the third Wednesday of every odd month. G. R. Muller, 43 Church St., Lambertville, N. J., secretary.

Southern New Jersey Veterinary Medical Association, the fourth Tuesday of each month at the Collingswood Veterinary Hospital, Collingswood. R. M. Sauer, secretary.

NEW MEXICO—Bernalillo County Veterinary Practitioners Association, third Wednesday of each month, Fex Club, Albuquerque, N.M. Jack Ambrose, 3018 N. Rio Grande Blvd., Albuquerque, secretary-treasurer.

NEW YORK—New York City, Inc., Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

New York State Veterinary College, Annual conference for veterinarians. Cornell University, Ithaca, W. A. Hagan, New York State Veterinary College, Cornell University, Ithaca, N. Y., dean.

Monroe County Veterinary Medical Association, the first Thursday of even-numbered months except August. Irwin Bircher, 50 University Ave., Rochester, N. Y., secretary.

NORTH CAROLINA—Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel, Greensboro. Joseph A. Lombardo, 411 Woodlawn Ave., Greensboro, secretary.

Eastern North Carolina Veterinary Medical Association, the first Friday of each month, time and place specified monthly. Byron H. Brow, Box 453, Goldsboro, N. Car., secretary.

Piedmont Veterinary Medical Association, the last Friday of each month. T. L. James, Box 243, Newton, N. Car., secretary.

Twin Carolinas Veterinary Medical Association, the third Friday of each month at Orange Bowl Restaurant, Rockingham, N. Car., at 7:30 p.m. J. E. Currie, 690 N. Leak St., Southern Pines, N. Car., secretary.

Western North Carolina Veterinary Medical Association, the second Thursday of every month at 7:00 p.m. in the George Vanderbilt Hotel, Asheville, N. Car. Vilu Lind, 346 State St., Marion, N. Car., secretary.

OHIO—Cincinnati Veterinary Medical Association, the third Tuesday of every month at Shuller's Wigwam, 6210 Hamilton Ave., at North Bend Road. G. C. Lewis, Cincinnati, Ohio, secretary-treasurer.

Columbus Academy of Veterinary Medicine, every month, September through May. E. M. Simonson, Columbus, Ohio, secretary-treasurer.

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Cuyahoga County Veterinary Medical Association, the first Wednesday in September, October, December, February, March, April, and May, at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. F. A. Coy, Cleveland, Ohio, secretary.

Dayton Veterinary Medical Association, the third Tuesday of every month. O. W. Fallang, Dayton, secretary.

Killbuck Valley Veterinary Medical Association, the first Wednesday of alternate months beginning with February. D. J. Kern, Killbuck, Ohio, secretary-treasurer.

Mahoning County Veterinary Medical Association, the third Tuesday of each month, at 9:00 p.m., Youngstown Maennerchor Club, Youngstown, Ohio. Sam Segall, 2935 Glenwood Ave., Youngstown, secretary.

Miami Valley Veterinary Medical Association, the first Wednesday of December, March, June, and September. J. M. Westfall, Greenville, Ohio, secretary-treasurer.

North Central Ohio Veterinary Medical Association, the last Wednesday of each month except during the summer. R. W. McClung, Tiffin, Ohio, secretary-treasurer.

Northwestern Ohio Veterinary Medical Association, the last Wednesday of March and July. C. S. Alvanus, Toledo, Ohio, secretary-treasurer.

Stark County Veterinary Medical Association, the second Tuesday of every month, at McBrides Emerald Lounge, Canton, Ohio. M. L. Willen, 4423 Tuscarawas St., Canton, Ohio, secretary.

Summit County Veterinary Medical Association, the last Tuesday of every month (except June, July, and August), at the Mayflower Hotel, Akron, Ohio. M. L. Scott, Akron, Ohio, secretary-treasurer.

Tri-County Veterinary Medical Association, the fourth Wednesday of January, May, and September. Mrs. R. Slusher, Mason, Ohio, secretary-treasurer.

OKLAHOMA—Oklahoma County Veterinary Medical Association, the second Wednesday of every month, 7:30 p.m., Patrick's Foods Cafe, 1016 N.W. 23rd St., Oklahoma City. Forest H. Stockton, 2716 S.W. 29th St., Oklahoma City, Okla., secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month in Directors' Parlor of the Brookside State Bank, Tulsa, Okla. Don L. Hohmann, 538 S. Madison St., Tulsa, Okla., secretary.

OREGON—Portland Veterinary Medical Association, the second Tuesday of each month, at 7:30 p.m., Ireland's Restaurant, Lloyds', 718 N.E. 12th Ave., Portland. Donald L. Moyer, 8415 S.E. McLoughlin Blvd., Portland 2, Ore., secretary.

Willamette Veterinarian Medical Association, the third Tuesday of each month, except July and August, at the Marion Hotel, Salem. Marvin M. Corff, McMinnville, Ore., secretary.

PENNSYLVANIA—Keystone Veterinary Medical Association, the fourth Wednesday of each month at the University of Pennsylvania, School of Veterinary Medicine. Raymond C. Snyder, N. E. Corner 47th St. and Hazel Ave., Philadelphia 43, Pa., secretary.

Lehigh Valley Veterinary Medical Association, the first Thursday of each month. Stewart Rockwell, 10th and Chestnut Sts., Emmaus, Pa., secretary.

Pennsylvania Northern Tier Veterinary Medical Association, the third Wednesday of each odd numbered month. R. L. Michel, Troy, Pa., secretary.

SOUTH CAROLINA—Piedmont Veterinary Medical Association, the third Wednesday of each month at the Fairforest Hotel, Union, S. Car. Worth Lanier, York, S. Car., secretary.

TEXAS—Coastal Bend Veterinary Association, the second

Wednesday of each month. J. Marvin Prewitt, 4141 Lexington Blvd., Corpus Christi, Texas, secretary.

VIRGINIA—Central Virginia Veterinarians' Association, the third Thursday of each month at the William Byrd Hotel in Richmond at 8:00 p.m. M. R. Levy, 312 W. Cary Ct., Richmond 20, Va., secretary.

Northern Virginia Veterinary Conference, the second Tuesday of each month. Francis E. Mullen, 1130 S. Main St., Harrisonburg, Va., secretary-treasurer.

Northern Virginia Veterinary Society, the Second Wednesday of every third month. Meeting place announced by letter. H. C. Newman, Box 145, Merrifield, secretary.

Southwest Virginia Veterinary Medical Association, the first Thursday of each month. I. D. Wilson, Blackburg, secretary.

WASHINGTON—Seattle Veterinary Medical Association, the third Monday of each month, Magnolia American Legion Hall, 2870 32nd W., Seattle, Wash. William S. Green, 9637 S. E. 36th, Mercer Island, Wash., secretary.

South Puget Sound Veterinary Association, the second Thursday of each month except July and August. O. I. Bailey, P. O. Box 906, Olympia, Wash., secretary.

WEST VIRGINIA—Kyowva (Ky., Ohio, W. Va.) Veterinary Medical Association, the second Thursday of each month in the Hotel Prichard, Huntington, W. Va., at 8:30 p.m. Harry J. Fallon, 200 5th St., W. Huntington, W. Va., secretary.

WISCONSIN—Central Wisconsin Veterinary Medical Association, the second Tuesday of each quarter (March, June, Sept., Dec.). R. J. O'Hern, P.O. Box 617, Cumberland, Wis., secretary.

Dane County Veterinary Medical Association, the second Thursday of each month. Dr. E. P. Pope, 409 Farley Ave., Madison, Wis., secretary.

Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. Dr. R. H. Steinkraus, 7701 N. 59th St., Milwaukee, Wis., secretary.

Northeastern Wisconsin Veterinary Medical Association, the third Wednesday in April. William Madison, 218 E. Washington St., Appleton, Wis., secretary.

Rock Valley Veterinary Medical Association, the first Wednesday of each month. W. E. Lyle, P. O. Box 107, Deerfield, Wis., secretary.

Southeastern Veterinary Medical Association, the third Thursday of each month. John R. Curris, 419 Cook St., Portage, Wis., secretary.

Wisconsin Valley Veterinary Medical Association, the second Tuesday of every other month. E. S. Scobell, Rt. 2, Wausau, Wis., secretary.

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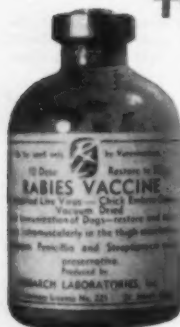
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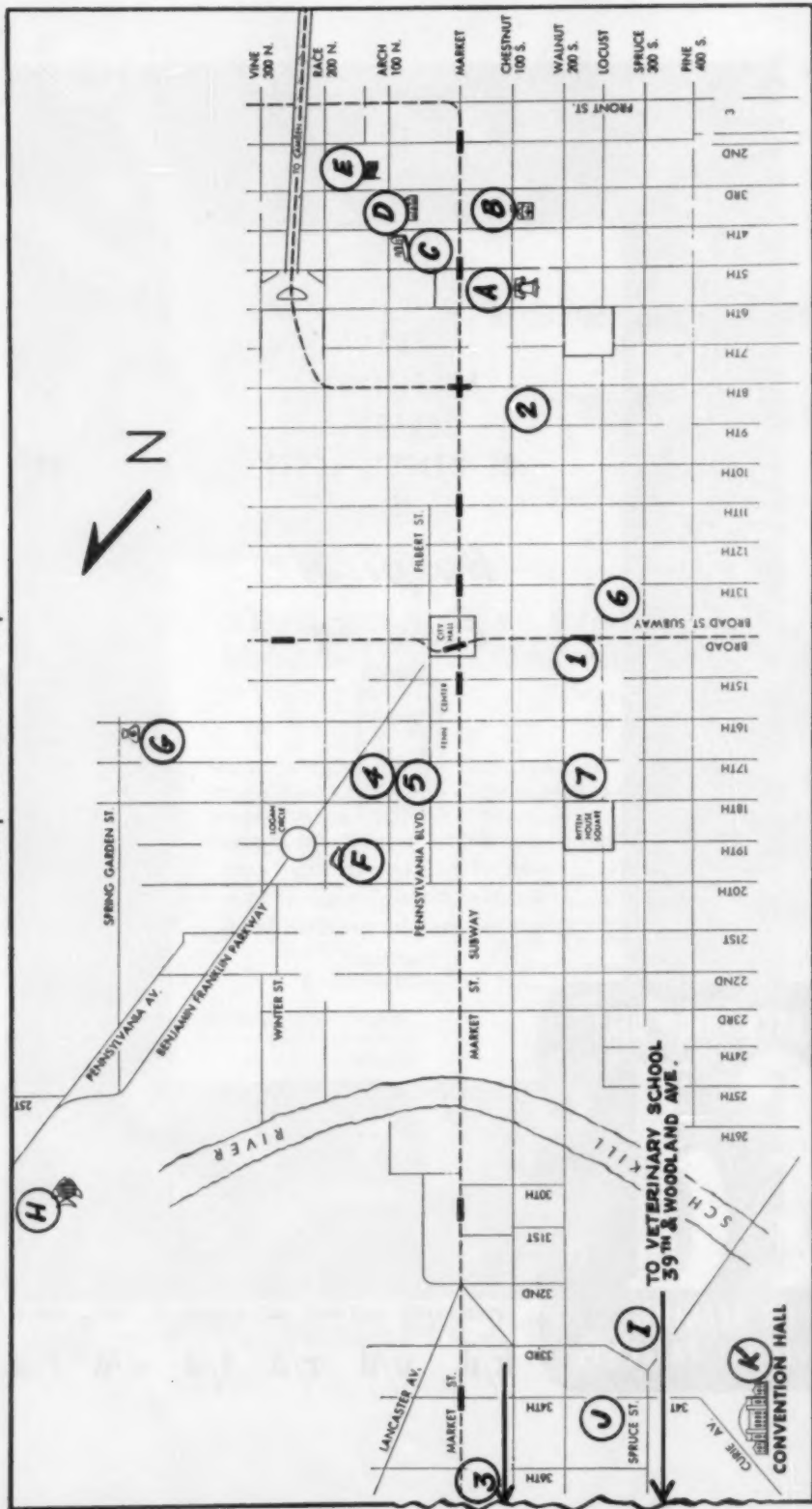
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Philadelphia Location Map



- | | | |
|---------------------------------|--------------------------------|-------------------------------|
| 1. Bellevue-Stratford Hotel | C. Franklin's Grave | G. U.S. Mint (Guided Tours) |
| 2. Benjamin Franklin Hotel | D. Friends' Meeting House | H. Aquarium |
| 3. Penn-Sherwood | E. Betsy Ross House | I. University Museum |
| 4. Robert Morris (not pictured) | F. Academy of Natural Sciences | J. University of Pennsylvania |
| 5. Sheraton Hotel | | K. Convention Hall |
| 6. Sylvania Hotel | | |
| 7. Warwick Hotel | | |
| 8. Independence Hall | | |
| 9. Carpenters' Hall | | |

HOTEL RESERVATIONS — PHILADELPHIA CONVENTION

Ninety-Fifth Annual AVMA Meeting, Aug. 18-21, 1958

All requests for hotel accommodations will be handled by a Housing Bureau in cooperation with the Committee on Local Arrangements. The Bureau will clear all requests and confirm reservations.

Hotels and Rate Schedule

Hotel	Single	Double	Twin	Suite
1. Bellevue-Stratford †	\$ 9.00-11.00	\$12.00-16.00	\$12.00-17.00	\$30.00-50.00*
2. Benjamin-Franklin †	9.00-11.00	12.00-15.00	16.00-18.00	.....
3. Penn Sherwood †	6.00- 7.50	11.00	13.50-14.00	15.50*
4. Robert Morris †	8.00	9.50	11.00	.....
5. Sheraton †	9.05-13.50	13.00	15.00-17.00	30.50-41.00*
6. Sylvania ††	7.50- 9.50	.....	10.00-13.00	25.00-27.50*
7. Warwick †	10.00-12.00	.....	15.00-18.00	30.00-35.00*

† Air-Conditioned
†† Partly Air-Conditioned
* 2-room suite

FAMILY PLAN — The 7 hotels listed above offer a "Family Plan" whereby children under 14 years of age receive accommodations free of charge. For more detailed information, contact the Housing Bureau.

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To: Housing Bureau, Philadelphia Convention and Visitors Bureau, Inc., Penn Square Building, Juniper & Filbert Sts., Philadelphia, Pa.

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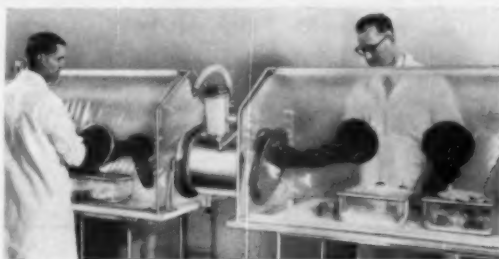
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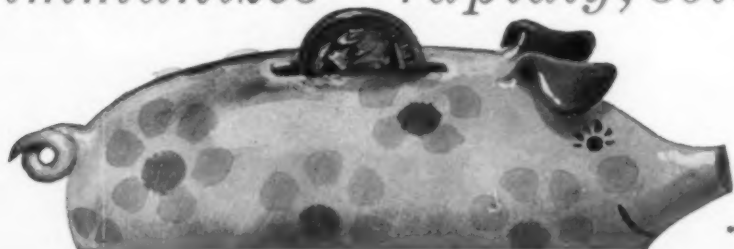
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Estimates place the annual loss to the livestock industry from stress conditions alone at \$250,000,000. As the exclusive source for Diquel, you play a major role in providing stockmen with the first important advance toward reduction of those losses.

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